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Inhaltsverzeichnis

Anmerkung: Eine fortlaufende Seitennummerierung wird pro Kapitel vorgenommen. Ein Literaturverzeichnis sowie die Anhänge werden jeweils am Ende eines Kapitels beziehungsweise eines Beitrags aufgeführt.

Verzeichnis der Beiträge

In dieser Dissertation werden die folgenden veröffentlichten und zur Veröffentlichung angenommenen Beiträge vorgestellt:

B1 Müller AL, Pfleger R (2014) Business Transformation towards Sustainability. In: Business Research 7 (2):313-350
(VHB JOURQUAL 2.1: 7,21 Punkte, Kategorie B)

B2 Müller AL (2014) Sustainability and Customer Relationship Management - Lines of research and success factors. In: Management Review Quarterly 64 (4):201-224
(VHB JOURQUAL 2.1: 6,09 Punkte, Kategorie C)

B3 Heidemann J, Kamprath N, Müller AL (2012) Kundenintegration in Geschäftsprozesse von Finanzdienstleistungsunternehmen. In: HMD - Praxis der Wirtschaftsinformatik 283:94-101
(VHB JOURQUAL 2.1: 5,19 Punkte, Kategorie D)

B4 Heidemann J, Kamprath N, Müller AL (2011) Die Integration des Kunden in Geschäftsprozesse – ein ökonomisches Modell und dessen Anwendung am Beispiel eines Versicherungsunternehmens. In: Bernstein A, Schwabe G (Hrsg) Tagungsbände der Wirtschaftsinformatik 2011, Zürich
(VHB JOURQUAL 2.1: 6,73 Punkte, Kategorie C)

B5 Braunwarth KS, Kaiser M, Müller AL (2010) Ökonomische Bewertung und Optimierung des Automatisierungsgrades in Versicherungsprozessen. In: Business and Information Systems Engineering 2 (1):29-39
(VHB JOURQUAL 2.1: 7,29 Punkte, Kategorie B)

I Einleitung

Die Megatrends Kunden-, Prozess- und Nachhaltigkeitsorientierung sind aktuell allgegenwärtig und stehen seit einiger Zeit im Mittelpunkt der gesellschaftlichen Diskussion (Meffert et al. 2010). Nachdem eine verstärkte Kundenorientierung bereits seit einigen Jahrzehnten an Bedeutung gewinnt (Rust et al. 2005), wird zunehmend auch die Verbesserung von Geschäftsprozessen als wichtige Herausforderung gesehen (Gartner 2010). Zudem sehen sich Unternehmen damit konfrontiert, die Bedürfnisse der Gegenwart zu befriedigen, ohne zu riskieren, dass künftige Generationen ihre eigenen Bedürfnisse nicht befriedigen können (WCED 1987). Es gilt daher die sozialen und ökologischen Ansprüche der Kunden in ökonomisch ausgerichtete Unternehmensabläufe bzw. Geschäftsprozesse zu integrieren (Baptist 2008). Da Unternehmen und Kunden in zunehmendem Maße die negativen Auswirkungen unseres aktuellen Produktions-, Konsum- und Lebensstils sowie der Knappheit der Ressourcen erkennen (Silvius und Schipper 2010), gewinnt die Berücksichtigung von Kunden und Nachhaltigkeit im Geschäftsmodell sowie die schrittweise Transformation zu einem kunden- und nachhaltigkeitsorientiertem Unternehmen durch eine entsprechende Gestaltung betrieblicher Prozesse zunehmend an Bedeutung. Damit sind die zentralen Entwicklungen, die im Rahmen dieser Dissertationsschrift genauer beleuchtet und in Abb. I-1 dargestellt werden, einerseits die gemeinsame Berücksichtigung der Trends „Kunden und Nachhaltigkeit“ und andererseits die integrierte Betrachtung der Integration von „Kunden und Geschäftsprozessen“.

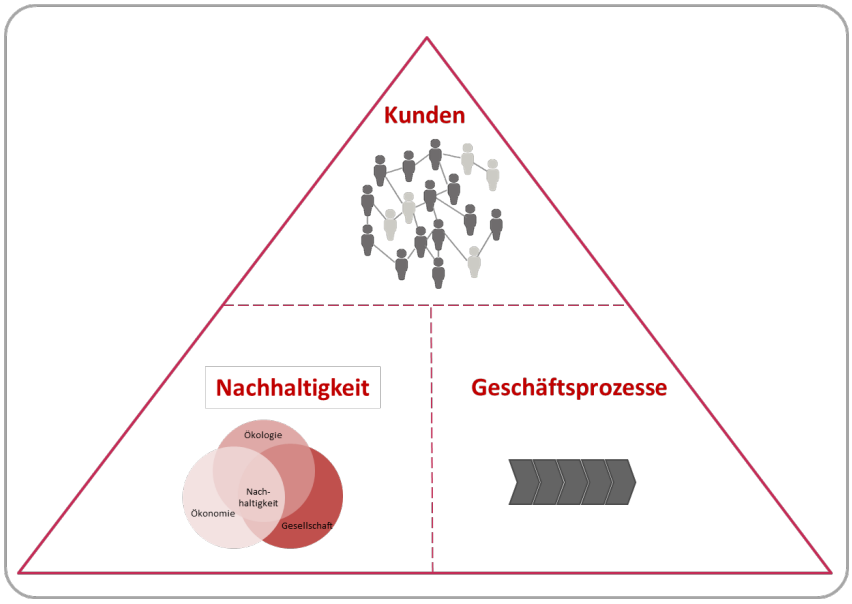

Abb. I–1 Überblick Forschungsrahmen

Im Folgenden werden die Megatrends Kunden-, Nachhaltigkeits- und Prozessorientierung jeweils zunächst einzeln diskutiert und darauf aufbauend die fokussierten integrierten Betrachtungen (d.h. nachhaltigkeitsorientierte Kunden und die Integration von Kunden in Geschäftsprozessen) detailliert vorgestellt.

Kunden werden von vielen Unternehmen als zentraler Bestandteil der Geschäftsstrategie (Heidemann et al. 2013) und als wesentliche Vermögenswerte (Hogan et al. 2002; Kumar et al. 2004) gesehen. Vor diesem Hintergrund ist seit etlichen Jahren in Wissenschaft und Praxis ein Umdenken von der ehemals vorherrschenden, eher kurzfristigen Produkt- bzw. Transaktionsorientierung hin zu einer langfristigen Kundenorientierung (Arndt 1979; Bagozzi 1974; Dwyer et al. 1987) festzustellen. Damit einher geht die Fokussierung des Konzepts des Relationship Marketing, welches das Ziel der Etablierung, Erhaltung und Verbesserung der Beziehung mit allen Stakeholdern verfolgte, auf den Kunden (Berry 1983; Payne und Frow 2006). Kunden bzw. Kundenbeziehungen stehen zudem zunehmend im Mittelpunkt vieler Unternehmensaktivitäten, weshalb das Kundenbeziehungsmanagement bzw. Customer Relationship Management (CRM) verstärkt in den Vordergrund tritt. In der Literatur existieren dabei verschiedene Definitionen von CRM, welche oft unterschiedliche Perspektiven (CRM als Prozess, als Strategie, als Technologie oder als Fähigkeit) fokussieren (Gneiser 2010). Eine Perspektiven-übergreifende Definition von CRM stammt in diesem Zusammenhang von Payne und Frow (2005, S. 168). Nach dieser wird CRM definiert als „*a strategic approach that is concerned with creating improved shareholder value through the development of appropriate relationships with key customers and customer segments. CRM unites the potential of relationship marketing strategies and IT to create profitable, long-term relationships with customers and other key stakeholders. CRM provides enhanced opportunities to use data and information to both understand customers and co-create value with them. This requires a cross functional integration of processes, people, operations, and marketing capabilities that is enabled through information, technology, and applications.*" Im Rahmen dieser Arbeit wird unter CRM folglich eine kundenorientierte Unternehmensstrategie verstanden, die mit Hilfe moderner Informationstechnologie versucht, auf lange Sicht profitable Kundenbeziehungen durch ganzheitliche und individuelle Marketing-, Vertriebs- und Servicekonzepte aufzubauen und zu festigen (Hippner und Wilde 2006).

Bei der integrierten Betrachtung der Megatrends der Kunden- und Nachhaltigkeitsorientierung stellt man fest, dass Kunden exisitieren, welche die negativen Auswirkungen unseres aktuellen Produktions-, Konsum- und Lebensstils intensiver als

Andere wahrnehmen und daher die nachhaltige Entwicklung stark vorantreiben. Von besonderer Bedeutung ist dabei die wachsende Kundengruppe der LOHAS, die einen Lebensstil pflegt, der von Gesundheitsbewusstsein und -vorsorge sowie der Ausrichtung nach Prinzipien der Nachhaltigkeit geprägt ist (Ray und Anderson 2000). Innerhalb dieser Kundengruppe ist nach Belz (2003) zwischen den sozial-ökologisch Aktiven, Aktivierbaren und Passiven zu unterscheiden: Erstere sind in hohem Maße für sozial-ökologische Anliegen sensibilisiert und verhalten sich dementsprechend. Sie schätzen sozial-ökologische Produkteigenschaften und sind gegebenenfalls bereit, dafür Nutzeneinbußen oder Kostenerhöhungen in Kauf zu nehmen. Die zweite Gruppe sieht darin zwar einen gewissen Selbst- und Fremdachtungsnutzen, ist aber nicht ohne weiteres bereit, Nutzeneinbußen oder Kostenerhöhungen für sozial-ökologische Produkteigenschaften in Kauf zu nehmen. Passive sehen keinen Mehrwert in der öko-sozial verträglichen Dimension eines Produkts. Produkte und Dienstleistungen sollten daher für die Kunden im Vergleich zu herkömmlichen Produkten eine ökologische oder soziale Wirkung entfalten und damit einen Mehrwert bieten (Belz 2001). Sollte ein Unternehmen nicht glaubwürdig agieren, besteht insbesondere bei den sozial-ökologisch aktiven und aktivierbaren Kunden die Gefahr, dass dieses Verhalten entlarvt wird und sich negativ auf den Unternehmenserfolg auswirkt (Trumann und Herhausen 2008). Bei der operativen Umsetzung von Nachhaltigkeit muss daher der Fokus auf den Bedürfnissen der Kunden liegen (Dyllick et al. 1997)

Es ist in diesem Zusammenhang unmöglich, eine weltweit einheitliche und für alle Akteure und Situationen geltende Definition der Nachhaltigkeit zu finden (Koplin 2006). Einigkeit herrscht allerdings darüber, dass der Begriff der "Nachhaltigkeit“[1] der deutschen Forstwirtschaft des 18. Jahrhunderts entstammt und dort ein Prinzip bezeichnet, demzufolge ein Wald so zu nutzen sei, dass - je nach forstwirtschaftlicher Interpretation - ein gleichbleibender Holzbestand, eine dauerhafte Holzgewinnung oder einen dauerhafter Gewinn gewährleistet ist (v. Carlowitz 1713). Hans Carl von Carlowitz formulierte bereits damals die Regel, dass nur die Menge an Holz geschlagen werde dürfe, die durch planmäßige Aufforstung wieder rekultivierbar ist. Das aktuelle Verständnis von nachhaltiger Entwicklung wurde dann maßgeblich durch den vom Club of Rome im Jahr 1972 in Auftrag gegebenen Bericht „Die Grenzen des Wachstums“ (Meadows et al. 1972) und die UN Conference on Environment and Development 1992 geprägt (Ruhwinkel 2013). Die drei Säulen der

[1] Die Begrifflichkeiten „Nachhaltigkeit“, „sustainability“ und „nachhaltige Entwicklung“ werden in dieser Dissertation synonym verwendet.

Nachhaltigkeit (ökologische Funktionalität, ökonomische Effizienz und soziale Verantwortung) sind dabei gleichrangig zu sehen und müssen integriert betrachtet werden (Elkington 2002; Enquete-Kommission 1998). Die ökonomische Dimension hat dabei die Erhaltung und Erweiterung der wirtschaftlichen Leistungsfähigkeit zum Ziel. Im Rahmen der ökologischen Dimension der Nachhaltigkeit stehen die Konsequenzen der Aneignung der Natur durch den Menschen im Mittelpunkt (Carnau 2011). Im Mittelpunkt der sozialen Dimension der Nachhaltigkeit steht die intra- und intergenerationelle Gerechtigkeit. Ökonomie, Ökologie und Soziales müssen als Einheit verstanden werden anstatt sich gegenseitig auszuspielen, um wirtschaftliches und politisches Handeln erfolgreich gestalten zu können (Enquete-Kommission 1994; Ruhwinkel 2013). Langfristig sollten daher alle drei Dimensionen der Nachhaltigkeit und deren Abhängigkeiten untereinander berücksichtigt werden (Dyllick und Hockerts 2002; Elkington 1997). So hat das Wachstum der Wirtschaft Auswirkungen auf die Dimensionen Ökologie und Soziales (Ruhwinkel 2013). Eine Fokussierung auf soziale und ökologische Aspekte kann jedoch möglicherweise im Widerspruch dazu stehen, dass Unternehmen als wirtschaftliche Systeme primäre Erträge generieren müssen, um ihre Existenz sicherzustellen. Der ökonomischen Dimension der Nachhaltigkeit kommt somit ein besonderer Stellenwert im Gesamtmodell zu. Dies hat einerseits seine Ursache in den Anforderungen der Kapitalmärkte und andererseits darin, dass Unternehmen kurzfristige Gewinne höher bewerten als in der Zukunft liegende Einsparungen von ökologischen oder sozialen Maßnahmen, die heute mit hohen Kosten verbunden sind (Dyllick und Hockerts 2002). Da Unternehmen in den vergangenen Jahren zunehmend kurzfristige Gewinne den Vordergrund gestellt und die langfristige und damit auch nachhaltige Ausrichtung des Unternehmens hinten angestellt haben, gewinnt die wertorientierte Unternehmensführung als Konkretisierung und Weiterentwicklung des Shareholder Value Prinzips immer mehr an Bedeutung (Coenenberg und Salfeld 2003; Rappaport 1986). Das Prinzip der wertorientierte Unternehmensführung fordert eine konsequente Ausrichtung aller Unternehmensteile und -aktivitäten an zu schaffenden Werten und sieht die langfristige Steigerung des Unternehmenswertes als zentrale Zielsetzung (Bruhn et al. 2000; Burmann 2003; Strack und Villis 2001). Im Bezug auf Entscheidungen zur kunden-, nachhaltigkeits- und prozessorientierten Ausrichtung eines Unternehmens heißt dies, dass die ökonomische Legitimation bzw. der „Business Case“ einzelner Maßnahmen berücksichtigt werden sollte und Kosten und Nutzen sorgfältig gegenübergestellt werden

sollten (Salzmann et al. 2005), da der langfristige Fortbestand des Unternehmens die wichtigste Prämisse ist.

Neben der kunden- und nachhaltigkeitsorientierten Ausrichtung unterziehen sich Unternehmen gleichzeitig einem organisatorischen Wandel weg von einer funktionalen, hin zu einer prozessorientierten Organisation (Haarländer et al. 2005). Zur Umsetzung einer ablauforientierten und damit Funktionsbereich-übergreifenden Denkweise sollten Unternehmen sich in Einklang mit ihren Zielen und unter Nutzung moderner Informations- und Kommunikationstechnologie stärker an Prozessen ausrichten (Becker et al. 2008; Ferstl und Sinz 2008; Hammer und Champy 1993). Betrachtete man das Zusammenwirken von Kunden und Geschäftsprozessen, stellt man fest, dass bei der Durchführung der Unternehmensaufgaben aktuell meist maschinelle und personelle Aufgabenträger integriert involviert sind. Der Entscheidung für den richtigen Aufgabenträger in (Geschäfts-) Prozessen und damit der Festlegung des passenden Automatisierungsgrads kommt eine besondere Bedeutung zu. Da Kunden die wichtigste „Ressource“ (Gouthier und Schmid 2001; Mellewigt und Nothnagel 2004) von Unternehmen sind, wird es immer wichtiger, die Auswirkungen der Festlegung eines bestimmten Automatisierungsgrads auf die Zufriedenheit und damit letzendlich Zahlungsbereitschaft eines Kunden zu berücksichtigen. Auch die aktive Einbindung der Kunden in die Wertschöpfung ist von essentieller Bedeutung, um sowohl eine kunden- als auch nachhaltigkeitsorientierte Ausrichtung zu schaffen. Aktuell wandeln sich Kunden immer mehr von passiven Leistungsempfängern zu aktiven Aufgabenträgern, die bspw. über Self-Services in das Unternehmen integriert werden (Rohrbeck et al. 2010). Kundenintegration bedeutet dabei, dass Kunden durch von ihnen zur Verfügung zu stellende sogenannte externe Faktoren in betriebliche Leistungserstellungsprozesse eingebunden werden und diese aktiv und ihren Bedürfnissen entsprechend mitgestalten können (Kleinaltenkamp 1997). Es gilt dabei, die (Geschäfts-) Prozesse auf die Kunden hin auszurichten (Hippner 2006) und die Kunden - unter Berücksichtigung der ökonomischen Auswirkungen - einzubinden. Dem Geschäftsprozessmanagement als ein ganzheitlicher Managementansatz kommt dabei eine wichtige Rolle zu, da es ermöglicht, eine integrierte Perspektive auf die Transformation zur nachhaltigen Organisation einzunehmen. Wenn fundamentale Prozessveränderungen angestrebt werden, ist es einerseits notwendig, die Rolle der menschlichen Akteure mit einzubeziehen. Andererseits ermöglicht ein Prozessverständnis zudem die Realisierung ökologischer Ziele in Bezug auf Kosten, Flexibilität und Zeit. (Loos et al. 2011)

Insgesamt stehen Unternehmen vor dem Hintergrund eines zunehmenden Bedürfnisses der Kunden nach nachhaltiger Entwicklung also – wie einleitend dargestellt – vor der Herausforderung, Transformations- und Prozessgestaltungsentscheidungen im Hinblick auf eine kunden- und nachhaltigkeitsorientierten Ausrichtung wertorientiert zu treffen. Ziel dieser Dissertationsschrift ist es daher, ausgewählte Themen der Nachhaltigkeit und der Prozessgestaltung im CRM näher zu beleuchten. Hierzu fokussiert Kapitel II Nachhaltigkeitsaspekte bei Transformationsentscheidungen und im Customer Relationship Management. Anschließend erfolgt in Kapitel III die Darstellung ausgewählter Aspekte der Integration von Kunden in Geschäftsprozesse. In Kapitel IV wird anschließend ein Einblick in die ökonomische Bewertung von Automatisierungsentscheidungen in Geschäftsprozessen gegeben und betrachtet, wie diese Entscheidungen das zukünftige Zahlungsverhalten von Kunden beeinflussen.

I.1 Zielsetzung und Aufbau dieser Dissertationsschrift

Die folgende Abb. I–2 strukturiert die verfolgten Ziele der Dissertationsschrift und veranschaulicht den Aufbau der Arbeit:

I. Einleitung	
Ziel I.1:	Darstellung der Zielsetzung und des Aufbaus der Arbeit
Ziel I.2:	Fachliche Einordnung und Motivation der zentralen Forschungsfragen
II. Berückichtigung von Nachhaltigkeitsaspekten bei Transformationsentscheidungen und im Customer Relationship Management (B1, B2)	
Ziel II.1:	Identifikation von verschiedenen Handlungsfeldern entlang der Wertschöpfungskette eines Unternehmens über die verschiedenen Dimensionen der Nachhaltigkeit
Ziel II.2:	Entwicklung eines Entscheidungsmodells zur Priorisierung von Transformationsentscheidungen im Nachhaltigkeitskontext unter Berücksichtigung der ökonomischen Auswirkungen
Ziel II.3:	Veranschaulichung des Einsatzes des Entscheidungsmodells am Fallbeispiel eines mittelständischen Unternehmens
Ziel II.4:	Definition des nachhaltigkeitsorientierten CRM und Abgrenzung von ähnlichen Begriffen
Ziel II.5:	Analyse der Ausgestaltung des nachhaltigkeitsorientierten CRM in den Kernbereichen Marketing, Sales und Services
Ziel II.6:	Ableitung zukünftig möglicher Forschungsschwerpunkte des nachhaltigkeitsorientierten CRM
IIII. Ausgewählte Aspekte der Integration von Kunden in Geschäftsprozesse (B3, B4)	
Ziel III.1:	Vorstellung innovativer Konzepte zur Kundenintegration in Geschäftsprozesse bei Finanzdienstleistungsunternehmen
Ziel III.2:	Analyse der Veränderungen in den Geschäftsprozessen und der Kundenrollen und Erkenntnisse zu den damit einhergehenden Chancen und Risiken
Ziel III.3:	Entwicklung eines quantitativen Entscheidungsmodells zur Bewertung der Kundenintegration in Geschäftsprozesse
Ziel III.4:	Veranschaulichung des Einsatzes des Entscheidungsmodells am Fallbeispiel eines international tätigen Finanzdienstleisters
IV. Ökonomische Bewertung von Automatisierungsentscheidungen in Geschäftsprozessen (B5)	
Ziel IV.1:	Entwicklung eines formalen Bewertungsschemas zur Bewertung der Berarbeitungsweise von Prozessdurchläufen
Ziel IV.2:	Darstellung der ökonomischen Abwägung zwischen den komparativen Vorteilen automatischer und manueller Bearbeitung
Ziel IV.3:	Entwicklung eines Entscheidungsmodells zur optimalen Wahl des optimalen Automatisierunsgrads einer Prozessaktivität
V. Fazit und Ausblick	
Ziel V.1:	Zusammenfassung der zentralen Erkenntnisse der Dissertationsschrift
Ziel V.2:	Aufzeigen künftigen Forschungsbedarfs

Abb. I–2 Aufbau und Ziele der Dissertationsschrift

I.2 Fachliche Einordnung und fokussierte Forschungsfragen

Die in dieser Arbeit enthaltenen Beiträge B1 bis B5 thematisieren verschiedene Aspekte der Nachhaltigkeit und der Prozessgestaltung im CRM. Sie lassen sich hierbei wie in Abb. I–3 dargestellt dem skizzierten Forschungsrahmen zuordnen:

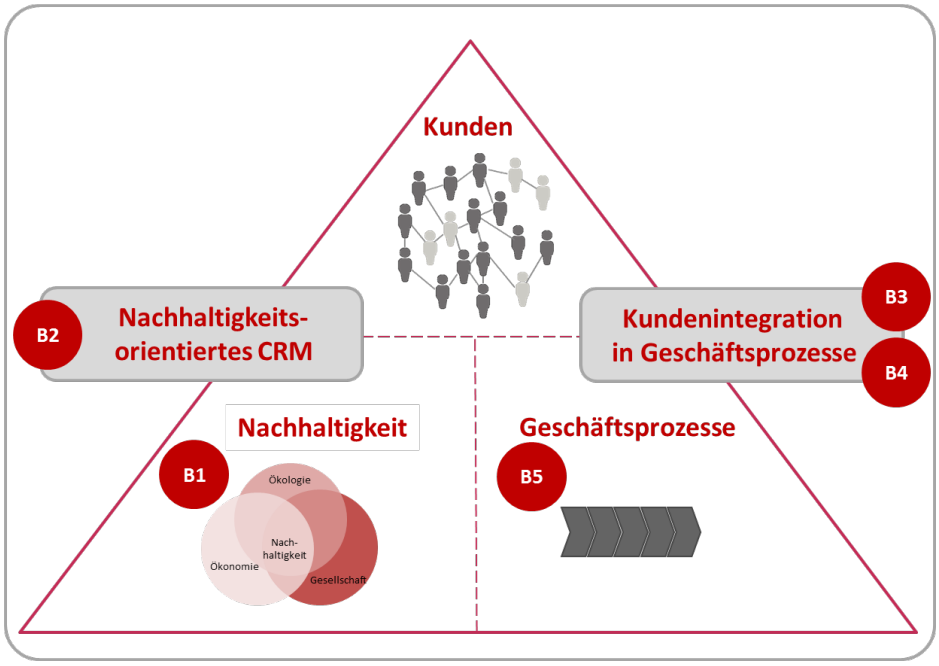

Abb. I–3 Einordung der wissenschaftlichen Beiträge in den Forschungsrahmen

I.2.1 Kapitel II: Berückichtigung von Nachhaltigkeitsaspekten bei Transformationsentscheidungen und im Customer Relationship Management

Kapitel II widmet sich verschiedenen Ansätzen, die Nachhaltigkeitsaspekte in der Unternehmenspraxis berücksichtigen. Da sich die Umsetzung von Nachhaltigkeitsmaßnahmen auf alle Wertschöpfungsprozesse auswirkt und grundlegende Veränderungen und Anpassungen im unternehmerischen Handeln nach sich zieht, greifen Beitrag 1 und 2 mit der Betrachtung von Transformationsentscheidungen im Nachhaltigkeitskontext und des nachhaltigkeits-orientierten CRM zwei wichtige Themengebiete heraus und betrachten diese näher.

Da die Strukturierung von Transformationsentscheidungen im Nachhaltigkeitskontext immer wichtiger wird, ist es für Unternehmen im Angesicht des aktuellen Megatrends der nachhaltigen Entwicklung von Bedeutung, zu identifizieren, wo diese Entwicklung bzw. Transformation ansetzen kann. Potenzielle Handlungsfelder ergeben sich entlang der Wertschöpfungsprozesse eines Unternehmens und in den verschiedenen Dimensionen der

Nachhaltigkeit (sozial, ökologisch und ökonomisch). Da die Umsetzung von Nachhaltigkeit im Unternehmen ein kontinuierlicher Prozess ist, gilt es den Fortschritt bzw. die Entwicklung in jedem dieser Handlungsfelder darzustellen. Dazu wird im Beitrag 1 die Idee von (Nachhaltigkeits-) Reifegradmodellen aufgegriffen, die es ermöglichen, stufenweise zu beschreiben, auf welchem Niveau sich ein Handlungsfeld gerade befindet. Auch das angestrebte Zielniveau kann anhand dieser Modelle bestimmt werden. Anhand dieser drei Aspekte (der *Corporate Activities*, der *Dimensions of Sustainability* und *der Sustainability Maturity Levels)* wird der *Sustainability Maturity Cube* entwickelt. Ziel dieses Konzepts ist es, Ansatzpunkte für eine nachhaltige Entwicklung im Unternehmen zu identifizieren. Das auf dem *Sustainability Maturity Cube* aufbauende Entscheidungsmodell hat das Ziel, ökonomisch motivierte Priorisierungsentscheidungen treffen zu können und berücksichtigt somit explizit die ökonomische Dimension in der Zielfunktion. Das Entscheidungsmodell soll folglich im Sinne einer wertorientierten Unternehmensführung helfen, Entscheidungen im Nachhaltigkeitskontext ökonomisch zu fundieren. Kern ist also nicht nur die Strukturierung der Entscheidungen, sondern auch die zugehörige Bewertung. Abschließend wird eine beispielhafte Anwendung des *Sustainability Maturity Cube* und des Entscheidungsmodells bei einem mittelständischen Unternehmen vorgestellt. Beitrag 1 verfolgt insgesamt folgende Forschungsziele:

Z. II.1 Identifikation von verschiedenen Handlungsfeldern entlang der Wertschöpfungskette eines Unternehmens über die verschiedenen Dimensionen der Nachhaltigkeit

Z. II.2 Priorisierung von Transformationsentscheidungen im Nachhaltigkeitskontext unter Berücksichtigung der ökonomischen Auswirkungen

Z. II.3 Veranschaulichung des Einsatzes des Entscheidungsmodells am Fallbeispiel eines mittelständischen Unternehmens

Beitrag 2 fokussiert die Ausgestaltung von Nachhaltigkeit im CRM. Während CRM und die damit einhergehende kundenorientierte Ausrichtung seit einigen Jahrzehnten Unternehmen prägt, hat das Streben nach nachhaltiger Entwicklung erst in den vergangenen Jahren an Bedeutung gewonnen. Kunden nehmen zunehmend wahr, dass es mit dem aktuellen Lebensstil nicht möglich sein wird, die Bedürfnisse künftiger Generationen befriedigen zu können und tragen damit erheblich zur Verbreitung dieser Entwicklung bei. In der wissenschaftlichen Literatur werden die beiden Themen Kunden- und Nachhaltigkeitsorientierung bisher hauptsächlich getrennt von einander betrachtet und eine

integrierte Betrachtung eines nachhaltigkeitsorientierten CRM wird selten eingenommen. Vor diesem Hintergrund nimmt sich Beitrag 2 einer Analyse des aktuellen Standes der Literatur zur Ausgestaltung des nachhaltigkeitsorientierten CRM an. Bei der Betrachtung der operativen Kernbereichen des CRM (Marketing, Sales und Services) fällt auf, dass sich eine Vielzahl von Beiträgen mit dem Marketing und der damit verbundenen Motivierung der Kunden zum Kauf nachhaltiger Produkte beschäftigt. Da es nur wenige Beiträge zur Nachhaltigkeit in den Kernbereichen Sales und Services und damit zur inhaltlichen Ausgestaltung und Umsetzung eines durchgängigen Kundenbetreuungskonzepts im Nachhaltigkeitskontext über seinen gesamten Lebenszyklus gibt, werden zudem zukünftig mögliche Forschungsschwerpunkte des nachhaltigkeitsorientierten CRM abgeleitet. Beitrag 2 adressiert damit folgende Forschungsziele:

Z. II.4 Definition des nachhaltigkeitsorientierten CRM und Abgrenzung von ähnlichen Begriffen

Z. II.5 Analyse des aktuellen Stand der Literatur zur Ausgestaltung des nachhaltigkeits-orientierten CRM in den Kernbereichen Marketing, Sales und Services

Z. II.6 Ableitung zukünftig möglicher Forschungsschwerpunkte des nachhaltigkeits-orientierten CRM

I.2.2 Kapitel III: Ausgewählte Aspekte der Integration von Kunden in Geschäftsprozesse

Kapitel IV widmet sich der Vorstellung verschiedener Aspekte der Integration von Kunden in Geschäftsprozesse, die im Zuge der stärkeren Kunden- und Prozessorientierung seit einigen Jahren zunehmend an Bedeutung gewinnt. Um dem interdisziplinären Forschungsgegenstand gerecht zu werden, beschreiben die Beiträge 3 und 4 verschiedene praktische Beispiele aus dem Finanzdienstleistungsbereich und Herangehensweisen zur ökonomischen Bewertung.

Beitrag 3 stellt am Beispiel von innovativen Geschäftsmodellen, die auf dem Konzept der Kundenintegration basieren, vor, wie unterschiedlich die Kundeneinbindung in Geschäftsprozesse gestaltet werden kann (Meuter et al. 2000): So wandelt sich der Kunde immer mehr vom passiven Leistungsempfänger hin zum aktiven Aufgabenträger, der in Geschäftsprozesse eingebunden wird und diese durch von ihm zur Verfügung gestellte Ressourcen eigeninitiativ mit gestalten kann (Kleinaltenkamp 1997). Neue Technologien wie bspw. Selbstbedienungsterminals oder Self-Service-Funktionalitäten ermöglichen es, dass

Kunden immer mehr Aufgaben ausführen können, die bisher im unternehmensseitigen Tätigkeitsbereich bei den Mitarbeitern lagen. Diese Entwicklungen forcieren nicht nur die Integration von Kunden in Geschäftsprozesse, sondern führen darüber hinaus auch zur Entstehung neuer Geschäftsmodelle und innovativer Produkte. Beitrag 3 gibt am Beispiel des „Social Banking“ der Fidor Bank AG und des Kreditgeschäfts von smava.de und der innovativen Abwicklung von Schadensfällen bei Sachversicherungen durch die iCard Insurance Deutschland GmbH Einblicke in die Ausgestaltung der Integration des Kunden bei Finanzdienstleistungsunternehmen. Insgesamt adressiert Beitrag 3 damit folgende Ziele:

Z. III.1 Vorstellung innovativer Konzepte zur Kundenintegration in Geschäftsprozesse bei Finanzdienstleistungsunternehmen

Z. III.2 Analyse der Veränderungen in den Geschäftsprozessen und der Kundenrollen und Erkenntnisse zu den damit einhergehenden Chancen und Risiken

Beitrag 4 widmet sich der ökonomischen Bewertung der Integration von Kunden in Geschäftsprozesse. Bei der Kundenintegration wird einerseits das Ziel verfolgt, Prozessverbesserungen und damit Kosteneinsparungen zu erzielen (Sharma und Tzokas 2002). Andererseits versprechen sich Unternehmen eine erhöhte Kundenbindung (Chow et al. 2008) sowie eine Steigerung der Kundenzufriedenheit (Burghard und Kleinaltenkamp 1996) und andere positive Effekte auf die Kundenbeziehung. Dabei bleibt oftmals unklar, mit welchen ökonomischen Auswirkungen die Kundenintegration für Unternehmen verbunden ist, da – wie bei zahlreichen anderen Projekten im Kundenbeziehungsmanagement – selten ein Monitoring oder eine Erfolgskontrolle der Maßnahmen erfolgt (Capgemini 2010). Anhand einer Analyse des aktuellen Stands der Literatur lässt sich feststellen, dass sowohl im Prozess- als auch im Kundenbeziehungsmanagement kaum quantitative Ansätze zur Bewertung der Kundenintegration in Geschäftsprozesse existieren. Um zu verhindern, dass faktisch unwirtschaftliche Projekte umgesetzt werden, ist das Ziel des Beitrags die Entwicklung eines quantitativen Modells, mit dessen Hilfe Entscheidungen über die Integration der Kunden in Geschäftsprozesse ökonomisch fundiert getroffen werden können. Im Einzelnen stehen dabei folgende Ziele im Mittelpunkt:

Z. III.3 Entwicklung eines quantitativen Entscheidungsmodells zur Bewertung der Kundenintegration in Geschäftsprozesse

Z. III.4 Veranschaulichung des Einsatzes des Entscheidungsmodells am Fallbeispiel eines international tätigen Finanzdienstleisters

Zusammenfassend beleuchtet Kapitel III damit verschiedene Aspekte der Integration von Kunden in Geschäftsprozesse.

I.2.3 Kapitel IV: Ökonomische Bewertung von Automatisierungsentscheidungen in Geschäftsprozessen

In Kapitel IV wird das Thema Industrialisierung von Geschäftsprozessen aufgegriffen. In diesem Zusammenhang gewinnt die Frage des adäquaten Aufgabenträgers (Mensch oder Maschine) zunehmend an Bedeutung. Unter der Zielsetzung einer wertorientierten Unternehmensführung ist sicherzustellen, dass die durch die Industrialisierung angestrebte Automatisierung von Geschäftsprozessen ökonomisch sinnvoll ist. Im Beitrag 5 wird daher ein Ansatz zur ökonomischen Abwägung zwischen den komparativen Vorteilen automatischer und manueller Bearbeitung entwickelt. Hierzu wird anhand des Glasschadenprozesses einer Versicherung untersucht, wie Automatisierungsentscheidungen getroffen werden können. Nach wertorientierten Kriterien wird für den einzelnen Schadensfall die Bearbeitungsweise gewählt, die den optimalen barwertigen Cashflow generiert. Bei der Bestimmung der optimalen Lösung spielt die Wirkung auf den Kunden eine wichtige Rolle. Im Gegensatz zur Anwendung von starren Einzelregeln ermöglicht dieser Ansatz neben einer standardisierten und automatisierten Bearbeitung eine flexible Betrachtung ex ante und zur Laufzeit. Außerdem wird eine Kapazitätsbetrachtung durchgeführt, die Aussagen über die optimale Ressourcenplanung zulässt. Beitrag 5 verfolgt somit insgesamt folgende Forschungsziele:

Z. IV.1 Entwicklung eines formalen Bewertungsschemas zur Bewertung der Berarbeitungsweise von Prozessdurchläufen

Z. IV.2 Darstellung der ökonomischen Abwägung zwischen den komparativen Vorteilen automatischer und manueller Bearbeitung

Z. IV.3 Entwicklung eines Entscheidungsmodells zur Wahl des optimalen Automatisierungsgrads einer Prozessaktivität

I.2.4 Kapitel V: Fazit und Ausblick

Abschließend werden in Kapitel V die wesentlichen Erkenntnisse dieser Dissertationsschrift zusammengefasst sowie Limitationen dargestellt, bevor ein Ausblick auf künftigen Forschungsbedarf gegeben wird.

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II Berückichtigung von Nachhaltigkeitsaspekten bei Transformationsentscheidungen und im Customer Relationship Management

In Kapitel II steht die Umsetzung von Nachhaltigkeit im Vordergrund. Unter nachhaltiger Entwicklung wird dabei eine Entwicklung verstanden, die es ermöglicht, die Bedürfnisse der Gegenwart zu befriedigen, ohne zu riskieren, dass künftige Generationen ihre eigenen Bedürfnisse nicht befriedigen können (WCED 1987). Im Nachhaltigkeitskontext stehen Unternehmen vor der Herausforderung, nicht nur über aller Unternehmensteile und -aktivitäten und damit die gesamte Wertschöpfungskette hinweg nachhaltig zu agieren, sondern dies an der Schnittstelle zu den Stakeholdern glaubhaft zu vertreten. Die Beiträge 1 und 2 stellen in diesem Zusammenhang verschiedene Nachhaltigkeitsaspekte bei Transformationsentscheidungen und im Customer Relationship Management vor. Beitrag 1 beschäftigt sich mit dem Weg von Unternehmen zur nachhaltigkeitsorientierten Ausrichtung und den dafür notwendigen Transformationsentscheidungen. Beitrag 2 fokussiert die nachhaltigkeitsorientierten Kunden und geht darauf ein, wie Unternehmen ein nachhaltigkeitsorientiertes Kundenbeziehungsmanagement gestalten können. Kapitel II zielt also insgesamt darauf ab, ein grundlegendes Verständnis über die Möglichkeiten zur Berücksichtigung von Nachhaltigkeitsaspekten zu schaffen und in den Beiträgen die genannten spezifischen Aspekte zu vertiefen.

II.1 Beitrag 1: „Business Transformation towards Sustainability“[1]

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Zusammenfassung:

Recently, organizations have recognized sustainability as an emerging mega-trend and as an increasingly important strategic goal. Its integration into the business model can be a key success factor, but also a challenge that requires a systematic approach. In order to comprehensively steer corporate sustainability, with the aim of minimizing negative externalities while maximizing positive effects, companies first need to structure their processes to achieve transparency on where sustainability actions can be incorporated. By furthermore considering the three dimensions of sustainability, possible starting points for sustainability actions can be identified. These two perspectives are complemented by adapting the basic idea of stages of development and maturity to sustainability context, as a way to capture the progress of sustainability actions within each corporate activity. The resulting "Sustainability Maturity Cube" serves as a blueprint, i. e. a first generic approach, of how an organization can structure the field of action for the transformation towards sustainability. Considering the paradigm of value-based management in business context, economic effects of the transformation towards sustainability have to be regarded. We therefore also propose a decision model, which allows aligning ecological, social, and economic objectives in order to draw economically useful conclusions by determining the optimal increase of the sustainability maturity level. To evaluate whether our approach proves useful for subject matter experts who are involved in sustainability decisions, we provide a first example of how a specific company can transform towards sustainability.

[1] The final publication is available at http://link.springer.com. (http://link.springer.com/article/10.1007/s40685-014-0011-y)

II.1.1 Introduction

In recent years, sustainability issues have gained increasing attention and importance. A 2009 survey of 224 business leaders worldwide showed that 60 per cent of them believe that ecological and social responsibility has increased in importance over the past years (Hiddleberger and Hittner 2009). A MIT Sloan Management Study on sustainability further revealed that two thirds of the 4.700 respondents agree that sustainability is essential to competitiveness and nearly three quarters agree that sustainability is a permanent part of their agenda and that their commitment will further increase (Kiron et al. 2012). Many examples like the immense global CO2 emissions, dwindling resources, child labor as well as the increasing gap between the richest and the poorest show that the consequences of our current way of living cause not only ecological but also social problems in the industrialized and developing countries (Lowe 1998).

Not only scarce resources and the emerging social problems, but also expectations of stakeholders of a company like its customers, investors, employees, suppliers, or society in general intensify the pressure on companies to integrate sustainable issues in their business. Companies need to manage these challenges to benefit from the transformational power of the development and thus make "sustainability" a key success factor (Hahn and Scheermesser 2006). Hence, its integration into the core business, i. e. business strategy, business model, and the value generating processes and products is required (Porter and Kramer 2006; Schaltegger and Müller 2008). Starting at strategy level, several types of sustainability strategies exist (Hardtke and Prehn 2001; Schaltegger et al. 2002; Baumgartner 2005). We distinguish introverted sustainability strategies (risk mitigation focusing on fulfilling legal and other external standards), extroverted sustainability strategies (legitimating approaches focusing on external relationships), conservative sustainability strategies (focusing on eco-efficiency), and visionary sustainability strategies (holistic approaches focusing on sustainability issues within all business activities) (Baumgartner and Ebner 2010). With regards to the business model and the underlying value generating processes and products, a wide range of management tools for implementing and measuring corporate sustainability has been developed (Schaltegger et al. 2002). As sustainability issues are being more and more institutionalized (Bansal and Bogner 2002; Bansal and Roth 2000; Prakash 2001) there are standardized management systems, guidelines, and official recommendations for environmental and social reporting, tools for the measurement of corporate sustainability, and

applied concepts, which try to facilitate the integration of sustainability into organizations (please refer to Appendix 1 for an overview on exemplary selected tools and management approaches). Tools for the measurement of corporate sustainability focus on controlling and managing the operationalization of sustainability strategies (Atkinson 2000; Figge and Hahn 2004a, 2004b; Huizing and Dekker 1992; Kaptein and Wempe 2001). The most prominent examples of sustainability measurement systems are the Sustainability Balanced Scorecard and sustainability maturity models: The first posits that for companies to contribute to sustainable development, it is desirable that corporate performance improves in all three dimensions of sustainability – economic, environmental, and social – simultaneously (Figge et al. 2002). Also the basic idea of (sustainability) maturity models, i. e. the concept of stages or levels of development, can be used to objectively evaluate a company's state with regards to sustainability and thus provides organizations a sensible tool to manage their sustainability capability (Becker et al. 2009; Kazanjian and Drazin 1989). The variety of tools and concepts shows the wide range of possibilities a company has for integrating sustainability into its business. It is therefore vital to structure the field of action by identifying where to start implementing sustainability (i. e. concrete possible starting points), what to do (exemplary sustainability actions), and where these actions have the greatest impact. Accordingly, our first research question is:

1. To transform towards sustainability, how can decision makers structure the field of action?

Although there are many studies concerning sustainable management, the overall economic effect of sustainability actions over all dimensions has not been investigated in detail yet. With the effects of ecological and particularly social actions being difficult to valuate, decision makers tend to neglect the economic consequences of sustainability actions as long as there is no structured approach for decision-making. It is thus the question how sustainability actions should be implemented in accordance with the paradigm of value-based management, i. e. considering economic effects. This leads to our second research question:

2. To transform towards sustainability, how should sustainability actions be implemented in ac-cordance with value-based management, i. e. when considering their economic effects?

To answer the first research question, we show how one can structure an organization's processes exemplarily using Porter's value chain (1985) with the aim of achieving transparency on where sustainability actions can be incorporated. By furthermore considering the three dimensions of sustainability, we propose possible sustainability actions, i. e. we

provide exemplary ideas on how to improve working conditions in production processes (social perspective) or optimization of delivery routes (ecological perspective) for instance. We complement these two perspectives (1st: Corporate Activities; 2nd: Dimensions of Sustainability) by additionally introducing a way to capture the progress of sustainability actions, adapting the basic idea of stages of development and maturity to sustainability context. The resulting *Sustainability Maturity Cube* serves as a blueprint, i. e. a first generic approach, of how an organization can structure the field of action for the transformation towards sustainability. It can build the basis for the instantiation of concrete sustainability maturity models and for deriving corporate actions. We answer the second research question by adapting the decision model based on Kamprath and Röglinger (2011), who conveyed the principles of value-based management to decision-making with process maturity models. We oppose costs and benefits of sustainability actions in order to determine how sustainability actions should be implemented considering their economic effects.

With the *Sustainability Maturity Cube* as a blueprint and the decision model at hand, we contribute to theory and practice: First, we combine already existing and acknowledged scientific concepts, such as Porter's value chain and maturity models, and adapt them to a new problem context, i. e. business transformation towards sustainability. Second, our approach provides organizations with decision-support as it, besides structuring their field of action, aligns decisions regarding the transformation towards sustainability with the paradigm of value-based management, taking into account the ambiguous role of the economic dimension in business context.

The remainder of this paper is organized as follows: Section 2 provides theoretical background on sustainability, corporate sustainability, and the idea of maturity models. In section 3, we structure the field of action for the transformation towards sustainability. The resulting Sustainability Maturity Cube illustrates the coherence of sustainability maturity levels, i. e. the state of development or progress, the corporate activities and dimensions of sustainability respectively. Following these elaborations, the decision model of Kamprath and Röglinger (2011) is extended and adapted for the economic valuation of sustainability actions in section 4. Section 5 exemplarily demonstrates the applicability of the approach. In section 6 we briefly summarize the key findings and provide topics for future research.

II.1.2 Theoretical Background

II.1.2.1 Sustainability - A multidimensional Construct

Sustainability and sustainable development (we use both terms synonymously in this paper) have been extensively discussed in academia and practice. As a broad range of aspects can be subsumed under the term sustainability, there is no common understanding and numerous definitions exist (cf. Kastenholz et al. 1996; Ruhwinkel 2013). Also Koplin (2006) concludes that it is impossible to find a globally uniform definition that holds true for all actors and situations. Grounded already in the 17th century with a resource-focused, i. e. ecological understanding (overexploitation of forests), the term sustainability has broadened its focus over the last decades. Today's understanding of sustainability derives from the international conferences on environmental issues starting in the 1960's and 70's. Prominent examples are the report "The Limits of Growth" of the Club of Rome in 1972 and the Brundtland Report "Our Common Future", which was published by the World Commission on Environment and Development (WCED) in 1987. While the Club of Rome focused on the long-term consequences of consumption and production patterns like population growth and environmental pollution, the WCED gave the first substantial impulse for sustainable development by defining sustainability as a "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987, Chapter 2, p.1). Sustainability actions can have social (e. g. concerning the equality of opportunities), environmental (e. g. concerning the quality of the eco-system), and economic (e. g. concerning a stable and healthy economy to ensure living conditions) implications. These three dimensions represent the three main pillars of sustainability and are also known as the "triple-bottom-line" concept (Elkington 1997). Whereas the success of the Brundtland definition stems from its opacity and its applicability in a growth context (Goodland 1995), also other definitions of sustainability (e. g. Ferguson et al. 2003; Epstein 2008) have the preservation and improvement of the economic, ecological, and social system for the benefit of existing and future generations in common.

The triple-bottom-line concept and the understanding of sustainability in the Brundtland Report furthermore share the belief that sustainable development requires implementing all dimensions, i. e. all pillars of sustainability equally and at the same time, as they are complementary, but not interchangeable. This concept can be described by the term strong sustainability (Figge et al. 2001). In contrast to that, weak sustainability is based on a theory

within ecological economics saying that the different existing sorts of capital, i. e. human (social dimension), natural (ecological dimension), or manufactured capital (economic dimension) can be substitutes for each other (Cieges et al. 2009). Weak sustainability thus does not account for possible negative externalities (e. g. consequences of consumption of dwindling resources) caused by the substitution with capital.

The parallel implementation of all dimensions of sustainability can be complementary or rival. As targets in the social or ecological dimension are not necessarily targets from an economic perspective, there may result conflicts, especially in a short-term view. However, these conflicts tend to resolve in the long-run. For example, keeping old technologies and realizing (short-term) economic savings, despite the existence of better solutions and hence causing higher environmental pollution, might result in customer dissatisfaction due to nonconformity with expected ecological behavior and thus decreasing sales that precipitate in the long-term. Ruhwinkel (2013) accordingly concludes that on a high level of aggregation, economic, ecological, and social developments are seen as an inner unity. Nevertheless, the difficulties regarding a clear definition, understanding, and thus operationalization of sustainability show that sustainable development is a complex and multidimensional issue, which has to combine efficiency, inter- and intra-generational equity on an economic, social, and environmental ground (Cieges et al. 2009; Ruhwinkel 2013). Thereby an “either or”-decision as well as the unyielding understanding of concepts like strong sustainability are not sufficient or too inflexible to describe the existing challenges and opportunities within this context. In this paper, we do not stick to one particular concept but follow the comprehensive but rather simplifying understanding of sustainability as a multidimensional concept that aims at ensuring or improving today’s living standards including ecological, social, and economic aspects. Thereby, negative externalities need to be prevented or kept to a minimum while positive externalities need to be encouraged and supported. With the different dimensions of sustainability being mutually dependent, from our point of view the most important challenge is to decide which solution is the best trade-off between the rivaling or syn-ergetic dimensions in each individual situation. Yet, in business context this is especially challenging as the economic dimension is of particular importance in conformity with the paradigm of value-based management.

II.1.2.2 Corporate Sustainability

In accordance with Freeman's stakeholder theory (Freeman 1984), researchers agree that companies have other responsibilities to their stakeholders besides economic issues (Salzmann et al. 2005). There are different concepts like corporate social responsibility (CSR), greening the business, eco-efficiency or eco-advantage (Schmidt et al. 2009) to address these responsibilities. Thereby, sustainability actions should be related to the context of the business, i. e. they should address issues of what is produced (products, services), how it is produced (processes), by whom (people), and its implication for stakeholders (Robinson et al. 2004).

However, what is the financial pay-off to seek justification for sustainability actions (Salzmann et al. 2005, p. 27)? The business case of sustainability has gained in importance – and companies face a dilemma. In accordance with the paradigm of value-based management, the consideration of costs, benefits, and risks when deciding on an investment is necessary, plausible, and an accepted standard. The same needs to hold true for sustainability context. Investments in sustainability actions normally mean financial burdens at least in a short-term view, which do not, or if at all, might only pay-off e. g. due to the fulfilment of stakeholder needs in the long run (cf. meet expectations of consumer groups like LOHAs (Life of Sustainability and Health (Ray and Anderson 2000)), green investment, CO2 emission certificates). Hence, securing survival in a market economy and at the same time integrating sustainability and "being good" or "being as sustainable as possible" does not necessarily resolve at first sight. It is impossible to give universally valid managerial advice on how to deal with conflicts between sustainability dimensions, the economic perspective however is of particular importance and can be seen as "ambiguous" in business context. Even though conflicts tend to dissipate in the long run according to Ruhwinkels' (2013) goal congruence of the three sustainability dimensions on a high aggregation level, an economic valuation is indispensable in accordance with value-based management as guiding principle. Thereby, the paradigm of value-based management implies that also long-term effects are considered in the valuation. Our understanding of corporate sustainability hence implies that the economic dimension needs to be treated with a special focus: on the one hand it is one of the three pillars of sustainability, but at the same time, as companies need to follow economic principles to survive in competition and to achieve long-term business success, it emerges as an additional organizational incentive when engaging in sustainability transformations (Seidel

et al. 2010). This differentiates the economic dimension from the other two dimensions of sustainability.

II.1.2.3 Stages of Development and Maturity

Based on the assumption of predictable patterns of organizational evolution and change, maturity models typically represent theories about how an organization's capabilities evolve in a stage-by-stage manner along an anticipated, desired, or logical path from an initial state to maturity (van den Ven and Poole 1995; Kazanjian and Drazin 1989). Accordingly, they are also termed stages-of-growth models, stage models, or stage theories (Prananto et al. 2003). In a wider definition, a maturity model is a management artifact that supports the systematic improvement of a complex, multi-faceted process or function - such as sustainability management. In a much narrower definition, maturity models are regarded as synonyms for assessment artifacts like e.g. the Capability Maturity Model Integration (CMMI) proposed by the Software Engineering Institute at Carnegie Mellon University (Paulk et a. 1993). Maturity models apply different stages of development or maturity as a measure to evaluate the capabilities of an organization in regards to a certain discipline, and thus provide a framework for prioritizing improvement actions that are meaningful to the organization (cf. de Bruin et al. 2005; Iversen et al. 1999). The objective is hence to assess the as-is situation, to incrementally build skills and capabilities, and to outline the stages of maturation paths in order to diagnose and eliminate deficient capabilities (Rummler and Brache 1990). Thereby, the maturity levels indicate an organization's current (or desirable) capabilities with regard to a specific class of entities (objects, application domains) (Rosemann and de Bruin 2005) meaning that if those capabilities are fulfilled, a certain level of maturity is achieved. By starting to look at single activities, companies can appraise their capability stage by appraising their existing process, so their performance indicators such as productivity, profitability, or customer satisfaction can be improved. For the remainder of this paper, the wider understanding of maturity models is of particular relevance to us as, with the *Sustainability Maturity Cube*, we intend to provide a blueprint that supports business transformation towards sustainability on a conceptualization level by structuring the field of action.

There now exist more than 150 different maturity models in various domains of application (cf. de Bruin et al.2005) and also some that can be applied to describe the transformation towards sustainability (please refer to Tab. II-6 in the appendix for an exemplary range of sustainability maturity models found in literature). The focus of sustainability maturity

models is on providing a scheme that supports the development, establishment, and persecution of a sustainability strategy for a company (Baumgartner and Ebner 2010). In literature, the terms sustainability maturity model and sustainability capability maturity model are used synonymously. We use the notion sustainability maturity model throughout the remainder of this paper. Sustainability maturity models basically apply a slight modification of the maturity levels of the CMM or CMMI respectively to define a five-level maturity grid: At Level 1 sustainability maturity is initial, there's little understanding of the subject and few or no related policies. Level 2 stands for a rudimentary level. Companies begin considering sustainability aspects in corporate decision-making, which means that – if existing – only mandatory rules and laws are respected. Maturity level 3 marks an elementary integration of these aspects into corporate strategy. In compliance with sustainability-related laws the organization has developed capabilities and skills and encourages individuals to contribute to sustainability programs. Level 4 represents a satisfying consideration and maturity of the specific sustainability aspect (often above the industry average). Sustainability is a core component of the business planning life cycles. Sophisticated maturity is defined by level 5, which implicates an outstanding effort towards sustainability. The organization employs sustainability practices across the entire enterprise and includes customers, suppliers, and partners. The industry recognizes the organization as a sustainability leader and uses its sustainability maturity practices to drive industry standards. (Baumgartner and Ebner 2010)

II.1.3 Structuring the Field of Action

To structure the field of action for the transformation towards sustainability, we need a conceptual framework to cover a holistic view of an organization's business model. By this means, we can capture and systematize those Corporate Activities (1st perspective) which might be critical for the value creation i. e. the success of a company. For all identified corporate activities we furthermore add the perspective Sustainability (2nd perspective) to enable analyzing the current state of sustainability, compartmentalized in its three dimensions (social, ecological, and economic). As a result, we are able to illustrate exemplary starting points for sustainability actions (cf. Tab. II-1) for the transformation towards sustainability in each corporate activity and for each dimension of sustainability. By adding Sustainability Maturity Levels as a third perspective to the resulting Sustainability Maturity Cube (cf. Abb. II-1), we offer a blueprint that allows for describing different stages of development or progress for all sustainability actions.

II.1.3.1 Identification and Systematization of Starting Points for the Transformation towards Sustainability

To identify adequate starting points for integrating sustainability, one needs to analyze the business system as a whole. By systemizing corporate activities (and underlying processes respectively) and the three dimensions of sustainability, we enable the application of sustainability maturity models to valuate transformation options on the most granular stage of a business system. Therefore, we systematically identify and illustrate those factors that may represent critical success factors for value creation and hence starting points for transformations towards sustainability.

There are various frameworks that support identifying core corporate activities: Rosemann and de Bruin (2005) for example name “strategic alignment”, “culture”, “people”, “governance”, “methods”, and “IT” as critical success factors that influence process success and hence business success respec-tively. Osterwalder and Pigneur (2010) present nine building blocks to describe or build a company’s business model, i. e. how an organization creates, delivers, and captures value (Osterwalder and Pigneur 2010): key partners, key resources, key activities, key relationships, customer segment, channels, revenue streams, value propositions, and cost structure. Analogously, Porter’s value chain (1985) helps to identify and structure those activities, which lead to a company’s competitive advantage. It enables the separation of the business system into a series of single strategic relevant activities that are value generating by distinguishing primary value chain activities and support activities. The primary activities are divided into the categories inbound logistics, operations, outbound logistics, marketing & sales, and service. These activities are directly related to the physical creation of a product, its sale and transfer to the customer as well as to the aftersales assistance. Thereby, all these activities are directly affecting customers’ perception and thus, the accumulation of value for the certain product or service, or for the company in total. As this methodology is highly known and recognized by researchers and practitioners (Sanchez and Heene 2003), it builds the basis of our blueprint. However, Porter’s value chain is just an exemplary framework to structure the field of action, and can be replaced by any other framework. Especially when focusing e. g. on the service sector, other frameworks which are not designed primarily for production issues could be used in order to account for inherent industry specifics. Independently of the respective industry though, the general framework of Porter’s value chain has to be adapted to each company individually (Porter 1985). Table 1

lists the primary and support activities (thereafter referred to as corporate activities) following Porter (1985) in the lines. This first perspective indicates where in the value chain companies can start the transformation towards sustainability. Adding the three dimensions of sustainability as second perspective further allows specifying these starting points. Thereby, several frameworks can provide support like the Global Reporting Initiative's G4 Sustainability Reporting Guidelines (GRI-guidelines) or Silvius and Schipper (2010) who suggested a checklist for successfully integrating sustainability in projects and project management. Although several other reporting guidelines have emerged like the OECD Guidelines for Multinational Enterprises (OECD 2011), or the UN Global Compact "Ten Principles" (United Nations Global Compact 1999), the GRI-guidelines are the most comprehensive and recognized standard (Brown et al. 2009; Global Reporting Initiative 2013). They provide an intuitive and clear overview to introduce and classify exemplary starting points for the transformation towards sustainability. In our paper, we thus follow these guidelines.

Tab. II-1 Illustration of exemplary Starting Points (Fields), classified according to the GRI-Guidelines, for the Transformation towards Sustainability, structured by Corporate Activities following Porter (1985) (1st Perspective, Lines) and the three Dimensions of Sustainability (2nd Perspective, Columns)

Primary Activities (Manufacturing Industry)					
	Activity	**Description of Activity**	**Exemplary Starting Points for Transformation towards Sustainability**		
			Social Dimension	**Ecological dimension**	**Economic Dimension**
Primary Activities	Inbound Logistics	Inbound Logistics include the procurement of raw materials, their warehousing, inventory control, vehicle scheduling, and returns to suppliers.	• **Labor Practices and Decent Work, Human Rights:** Fair working conditions (e.g. part-time model)	• **Transport:** Improve vehicle scheduling to reduce CO_2-emissions (e.g. algorithmic optimization of routes)	• **Economic Performance:** Improve warehousing time (e.g. Kanban System)
	Operations	Operations include all activities that are associated with the transformation of inputs into the final product form. Exemplary activities are machining, packaging, assembly, equipment maintenance, and testing.	• **Labor Practices and Decent Work, Human Rights:** Fair working conditions (e.g. no child labor in textile industry)	• **Energy:** Usage of modern machines with a good energy balance and efficiency • **Materials:** Recyclable packaging materials	• **Economic Performance:** Usage of modern machines with a good energy balance and efficiency
	Outbound Logistics	Outbound Logistics include activities that are associated with collecting, storing, and physically distributing the end product to customers. Examples are warehousing, material handling, delivery vehicle operation, order processing, and scheduling.	• **Labor Practices and Decent Work, Human Rights:** Fair working conditions (e.g. working hours)	• **Transport:** Improve vehicle scheduling to reduce CO_2-emissions (e.g. managed order cycles (economies of scale), degree of capacity utilization in shipping)	• **Economic Performance:** Improve warehousing time (e.g. just-in-time production)
	Marketing and Sales	Marketing and Sales include all activities that are associated with providing a reason by which customers want to purchase the product and tempt them to do so. Exemplary activities are advertising, promotion, sales force, quoting, channel selection, channel relations, and pricing.	• **Human Rights:** Promotion or image campaigns can propagate the companies' sustainable products, services or manufacturing processes	• **Materials, Effluents and Waste:** By using less print and focusing more on online marketing, firms can reduce material input	• **Economic Performance:** By using less print and focusing more on online marketing, firms can reduce material input
	Service	Service includes all activities that are associated with providing the service to enhance or maintain a products' value, such as installation, repair, training, parts supply, and product adjustment.	• **Materials:** Long life guarantees • **Society:** Free service guarantees in case of damage within a certain period of time after the buy	• **Materials Effluents and Waste:** Ensure long lifetime of products	• **Economic Performance:** Free service guarantees

Support Activities (Manufacturing Industry)					
Support Activities	Procurement	The procurement deals with purchasing inputs, such as materials, supplies and equipment.	• **Human Rights:** Fair trade	• **Materials:** Choice of resources (e.g. recyclable materials, avoiding or reducing the usage of scarce resources)	• **Economic Performance:** Choice of material
	Infrastructure	The infrastructure of a firm includes for example the general management, planning, finance, accounting, legal, government affairs, quality management, organizational structure, control systems as well as the company culture.	• **Labor Practices and Decent Work:** Volunteering projects like mentoring programs as a part of a companies' daily life	• **Energy:** Proper communication systems improve virtual meetings and reduces necessity to travel • **Energy:** Intelligent Housing reduces energy consumption	• **Economic Performance:** Proper information systems can lead to competitive advantages, Intelligent Housing
	Human Resources	The Human Resource Management includes all activities associated to recruiting, hiring, training, development, and compensation of all types of personnel.	• **Labor Practices and Decent Work:** A responsible treatment of employees, e.g. healthy work environment • **Labor Practices and Decent Work:** company kindergarten • **Labor Practices and Decent Work:** employee training	• **Materials, Effluents and Waste:** By using less print and focusing more on online recruiting, firms can reduce material input	• **Economic Performance:** Sustainable process in hiring, can reduce costs due to effective choices of the right and fitting personnel
	Technology Development	The technology development, which includes for example activities like component design, feature design, field-testing, process engineering, and technology selection, sums up technologies that support the value-creating activities.	• **Labor Practices and Decent Work:** Fair working conditions (e.g. home office to combine work and family life)	• **Energy:** Implementing measures of Green IS • **Energy:** improve communication (reduce travel times)	• **Economic Performance:** Use IT as enabler (e.g. improve communication and reduce travel times, intelligent housing)

After having proposed a way to identify and systemize possible corporate activities and related starting points for transformation towards sustainability, in the next step the underlying processes and hence their specific possible transformation need to be analyzed. By doing so, one can define current stages of development and achieve transparency regarding definite and necessary actions which have to be implemented in order to reach a targeted stage. For this, we propose sustainability maturity models that enable describing current and targeted sustainability maturity levels.

II.1.3.2 The Sustainability Maturity Cube

Depending on the progress and strength of the transformation towards sustainability in the respective company, different stages of development within each sustainability dimension and corporate activity and hence within each starting point can be reached. A company that has already implemented sustainable actions at some stages could have achieved a certain level of maturity in some of the identified corporate activities and thus can improve its actual situation by further transformation.

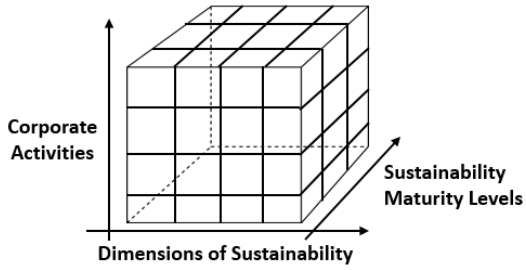

Abb. II-1 "Sustainability Maturity Cube"

Abb. II-1 summarizes the resulting *Sustainability Maturity Cube*. The perspectives, namely the *Corporate Activities*, the *Dimensions of Sustainability*, and the according *Sustainability Maturity Levels* form a cube that structures the possible field of action regarding transformations towards sustainability. One field of the cube represents the description of a certain sustainability maturity level in one of the three dimensions of sustainability for one identified corporate activity. Thereby, the *Sustainability Maturity Cube* can be seen as a blueprint that is based on acknowledged scientific concepts to support the systematic improvement of sustainability management by considering certain corporate activities, the three dimensions of sustainability and the corresponding stages of development. Of the three perspectives of the cube, only the operationalization of the *Dimensions of Sustainability* is fixed: Our understanding of sustainability as a multidimensional concept that aims at ensuring or improving today's living standards including ecological, social, and economic aspects leads to the three dimensions, i. e. ecological, social, and economic dimension. Regarding the other two perspectives, we only suggest applicable frameworks like Porter's value chain and maturity models, which are not further predefined, to describe the perspectives *Corporate Activities* and *Sustainability Maturity Levels* respectively. Hence, the *Sustainability Maturity Cube* provides the basic understanding and concept for transformations towards sustainability. It furthermore allows for developing concrete sustainability maturity models. At this point, we

do not instantiate a concrete sustainability maturity model ourselves in order to keep the generic character of our approach. However, there are several issues that have to be considered when instantiating a concrete sustainability maturity model, such as the determination of current and targeted sustainability maturity levels, the formulation of concrete development paths from initial to desired maturity levels, the consideration of confounding effects (e. g. when implementing several actions at the same time), and situations when it makes sense to invest in a particular action or not. We address some of these issues in the real-world application of the *Sustainability Maturity Cube* in the section *Operationalization of the Approach* and thus provide first insights in such an instantiation. We will now focus on our second research question: the overall economic valuation of the transformation towards sustainability.

II.1.4 Decision Model

In accordance with value-based management, it is a main target of a company to identify the priority sustainability actions to improve on. To do so, based on the ideas of Kamprath and Röglinger (2011), the implementation of sustainability actions in order to increase sustainability maturity levels are regarded as investments. Kamprath and Röglinger (2011) analyze the general economic relationship of process improvement with maturity models and develop an economic decision model. The basic idea of the model is to consider the improvement of the maturity level as investment(s) with resulting cash in- and outflows. It is aim of the model to identify the configuration of improvement actions that maximize the total additional present value cash surplus. Consequently, the cash flows that come along with improvements of sustainability maturity levels have to be examined.

II.1.4.1 Assumptions of the Decision Model

In doing so, some prerequisites have to hold true: Most maturity models are based on the assumption that maturity levels only take integer levels (cf. Software Engineering Institute 2010) but in practice there might be maturity levels in between integer values. Hence, the underlying model uses real-valued maturity levels. Furthermore, determining the concrete monetary values of the consequences of sustainability actions may require applying approaches such as Power (2008) who for example measures the emerging benefits of investments that increase energy efficiency solely on the basis of utility values for environmental, social or economic benefits. Furthermore, we assume that some metrics can be

estimated ex ante. However, being aware that this does not hold true for all metrics we elaborate on which metrics can be estimated and which cannot: There are numerous frameworks of sustainability assessment, which can provide assistance in determining such sustainability metrics. Most of the frameworks presented in Tab II-5 of the Appendix , e. g. the Global Reporting Initiative, the environmental management systems, such as the ISO and EMAS standards, or the study of the Center for Waste Reduction Technologies (CWRT) of AIChE (2004) provide a variety of possible sustainability indicators. While it is important to assess sustainability with several indicators, it may sometimes be difficult to make business decisions and comparisons among companies as these indicators are measured in very different units (Krajnc and Glavic 2005). Hence, sustainability indicators are helpful for decision-making but need to be examined carefully for their use in decision models.

With regard to the different dimensions of sustainability, we find that all environmental problems can finally be traced back to physical and/or chemical interventions (Heijungs and Guinée 1992). Contrary, due to the great variety and diversity of social aspects and the lack of a common foundation in natural sciences as found for environmental aspects, it is very difficult to achieve a comprehensive classification of social aspects (Clarkson 1995). Even more, social aspects heavily depend on the preferences and values of the different actors involved (Zadek 1999). The stakeholder approach (Freeman 1984) for example provides a useful framework to classify the actors concerned with different social claims as it clarifies the interested groups and their wants and desires (Clarkson 1995). (Figge et al. 2002)

II.1.4.2 Formulation of the Decision Model

Depending on whether a company already applies sustainability maturity models or not it may already has achieved a certain sustainability maturity level in the identified starting point for transformation towards sustainability P_{ij} where there are C_i $(0 \leq i \leq n)$ identified corporate activities and D_j $(1 \leq j \leq 3)$ dimensions of sustainability. Thus, each of the $i \cdot j$ starting points has a current sustainability maturity level which is $m_{ij}^{cur} \in \mathbb{R}_0^+ \left(m_{ij}^{min} \leq m_{ji}^{cur} \leq m_{ji}^{max}\right)$, whereby $m_{ij}^{max} \in \mathbb{R}^+$ represents the highest achievable sustainability maturity level and $m_{ij}^{min} \in \mathbb{R}_0^+$ $(m_{ij}^{min} < m_{ij}^{max})$ is the lowest realisable sustainability maturity level. The sustainability maturity level of each starting point can be increased by Δm_{ij} $(0 \leq \Delta m_{ij} \leq m_{ij}^{max} - m_{ij}^{cur})$. An aggregation function $g(\overrightarrow{\Delta m_i})$ with $\overrightarrow{\Delta m_i} = (\Delta m_{i1}, \Delta m_{i2}, \Delta m_{i3})^T$ considers potential synergies or rivalries between the different dimensions of sustainability (e. g. higher

costs for fair trade products in procurement) within one corporate activity. Additionally, there is a second aggregation function $f(\overrightarrow{\Delta m})$ with $\overrightarrow{\Delta m} = (\overrightarrow{\Delta m_1}, \dots, \overrightarrow{\Delta m_n})^T$ which aggregates the total sustainability maturity level regarding the synergies and rivalries between different corporate activities. Both functions will not be examined in detail in this paper (cf. Kamprath and Röglinger 2011).

Implementing actions to improve sustainability (and thus the sustainability maturity level) requires investments I. These payments may differ from starting point to starting point and may not be necessarily completed in one period; therefore the net present value of the investment I will be applied. Whereas small improvements of the sustainability maturity level can be implemented relatively straightforward, greater improvements of the sustainability maturity level are expected to require a more complex approach, which results in higher cash outflows. This relationship holds true e. g. in project management or software engineering (cf. Boehm et al. 2000) and also in the context of sustainable development as complexity will grow with more sophisticated actions. Additionally, it has to be taken into account that depending on the current sustainability maturity level for each starting point (m_{ij}^{cur}) the investment payment I differs, i. e. it grows positively related with the current value of m_{ij}^{cur}. Thus, a strictly monotonic increasing, strictly convex, and twice continuously differentiable function $I_{ij}^{cur}(\Delta m_{ij}) \in \mathbb{R}_0^+$ (e. g. a quadratic function) can characterize the investment I which is necessary for increasing the sustainability maturity level of each starting point P_{ij} by a certain Δm_{ij}. The following equation can be applied:

$$I_{ij}^{cur}(\Delta m_{ij}) = I_{ij}(m_{ij}^{cur} - m_{ij}^{min} + \Delta m_{ij}) - I_{ij}(m_{ij}^{cur} - m_{ij}^{min}) \quad (1)$$

Additionally to the investments I, the cash in- and outflows of the respective operational business have to be considered. There will be cash outflows O to ensure the continuous implementation and the support for sustainability. The more sustainability actions are implemented the more complex the integration with existing actions (cf. investments I) and the more difficult to maintain a high sustainability maturity level over a long period of time. Therefore, a strictly monotonic increasing, strictly convex, and twice continuously differentiable function $O_{ij}^{cur}(\Delta m_{ij}) \in \mathbb{R}_0^+$ (e. g. a quadratic function) can be applied to characterize the cash outflows O that come along with increasing the sustainability maturity level of each starting point P_{ij} by Δm_{ij}.

Besides, there are other direct economic consequences resulting from the investment in sustainability for each starting point P_{ij}: Savings S. One example for these savings regarding the corporate activity "Human Resources" can be: By improving working conditions and thus employees' satisfaction, the fluctuation of employees (cf. turnover rate) and thus the need to spend more on recruiting can be reduced (Arnold and Feldman 1982). A strictly monotonic increasing, strictly concave, and twice continuously differentiable function $S_{ij}^{cur}(\Delta m_{ij}) \in \mathbb{R}_0^+$ (e. g. a root function) can characterize these direct savings S.

On the other side, the most important factor influencing the price and quantity of sales, i. e. cash inflows E is the customers' willingness to pay. The customers and especially the aforementioned LOHAS (Lifestyle of Health and Sustainability) (Ray and Anderson, 2000), are expected to be willing to pay more for a more sustainable product or service. These shifts in human attitude are difficult to trace but recent studies show that customers' mind-sets changed towards a more sustainability oriented direction: A survey conducted by market research group GfK suggests that consumers in five of the world's leading economies are turning to "ethical consumerism" (Grande 2007). Furthermore, consumers claim they would pay a 5-10% premium for ethical products even though a practical analysis shows that such brands have relatively small market shares (Grande 2007). Hence, if a company succeeds in satisfying the expectations of these customers, it positively affects their customer satisfaction (Matzler, 2000), customer loyalty and reference potential, i. e. the number of potential customers that one customer can reach during his lifetime (Rudolf-Sipötz 2001). The named effects finally result in higher expected customer cash flows (Krafft 1999) and in an alteration of the customer lifetime value (CLV), which is the present value of all future profits generated from a customer (Gupta and Lehmann 2003). The CLV can thus be applied to estimate customers' reactions to sustainability actions. Furthermore, as the CLV is difficult to determine, the perception of the customers can also be evaluated by questioning the customers in structured surveys. As customers and especially LOHAS are assumed to be price sensitive we can assume a strictly monotonic increasing but - due to the diminishing marginal utility - strictly concave and twice continuously differentiable function $E^{cur}\left(f(\overrightarrow{\Delta m})\right) \in \mathbb{R}_0^+$ (e. g. a root function) to characterize the cash inflows E that come along with increasing the sustainability maturity level of each starting point P_{ij} by Δm_{ij}. Summarizing, the following equations can be applied to determine the value of the resulting cash in- and outflows for each starting point P_{ij}:

$$O_{ij}^{cur}(\Delta m_{ij}) = O_{ij}(m_{ij}^{cur} - m_{ij}^{min} + \Delta m_{ij}) - O_{ij}(m_{ij}^{cur} - m_{ij}^{min}) \quad (2)$$

$$S_{ij}^{cur}(\Delta m_{ij}) = S_{ij}(m_{ij}^{cur} - m_{ij}^{min} + \Delta m_{ij}) - S_{ij}(m_{ij}^{cur} - m_{ij}^{min}) \quad (3)$$

$$E^{cur}\left(f(\overrightarrow{\Delta m})\right) = E(m^{cur} - m^{min} + f(\overrightarrow{\Delta m})) - E(m^{cur} - m^{min}) \quad (4)$$

Finally, it is the question, which target determines the optimal improvements of the sustainability maturity level. In accordance with the principles of value-based management the regarded company strives for the maximization of the total additional payments surplus $CF(\overrightarrow{\Delta m}) \in \mathbb{R}$. This results from the difference between the investment I and the payments surplus of the cash outflows O and cash inflows S and E:

$$MAX: CF(\overrightarrow{\Delta m}) =$$
$$-\sum_{i=1}^{n}\sum_{j=1}^{3} I_{ij}^{cur}(\Delta m_{ij}) - \sum_{i=1}^{n}\sum_{j=1}^{3} O_{ij}^{cur}(\Delta m_{ij}) + \sum_{i=1}^{n}\sum_{j=1}^{3} S_{ij}^{cur}(\Delta m_{ij}) + E^{cur}(f(\overrightarrow{\Delta m})) \quad (5)$$

The initial optimal strategy is the one, which maximizes the expected value of the objective function given the initial beliefs. We solve this optimization problem by obtaining the derivatives of the function of the total additional payments surplus. The first partial derivatives in the universal form are:

$$\frac{\partial CF(\overrightarrow{\Delta m})}{\partial \Delta m_i} = \frac{\partial I_{ij}^{cur}(\Delta m_{ij})}{\partial \Delta m_i} - \frac{\partial O_{ij}^{cur}(\Delta m_{ij})}{\partial \Delta m_i} + \frac{\partial S_{ij}^{cur}(\Delta m_{ij})}{\partial \Delta m_i} + \frac{\partial E^{cur}(f(\overrightarrow{\Delta m}))}{\partial \Delta m_i} \quad (6)$$

$$\frac{\partial CF(\overrightarrow{\Delta m})}{\partial \Delta m_j} = \frac{\partial I_{ij}^{cur}(\Delta m_{ij})}{\partial \Delta m_j} - \frac{\partial O_{ij}^{cur}(\Delta m_{ij})}{\partial \Delta m_j} + \frac{\partial S_{ij}^{cur}(\Delta m_{ij})}{\partial \Delta m_j} + \frac{\partial E^{cur}(f(\overrightarrow{\Delta m}))}{\partial \Delta m_j} \quad (7)$$

Based on the first partial derivatives the partial marginal solutions, conditions, and characteristics of an internal solution can be obtained. For a detailed description on how to determine these values we refer the interested reader to Kamprath and Röglinger (2011).

As the target of this paper is to introduce a blueprint for the transformation of companies towards sustainability, the applied functions are not further specified. Each company, which aims at aligning ecological, social, and economic objectives and drawing economically useful conclusions in this context, has to customize the proposed functions. Furthermore, potentially existing synergies and rivalries between the dimensions of sustainability and between the corporate activities have to be further examined as they were not analyzed in detail in this model. Additionally, the individual actions to reach the economically optimal target have to be outlined. Altogether, the presented decision model allows identifying the economically

optimal increase of the sustainability maturity level of each identified corporate activity and thus represents a first approach to quantify decisions regarding transformation towards sustainability.

II.1.5 Operationalization of the Approach

As the real-world application of a model generally allows drawing interesting implications for its further operationalization, in the following we describe an example of how to manage sustainability projects in practice, applying our approach. We were able to accompany the instantiation of the *Sustainability Maturity Cube* and the application of our decision model in an in its branch leading and listed German middle-sized company. To outline how a specific company can transform towards sustainability, we first present the data collection process and then define the corporate activities and their current sustainability maturity levels. To test the robustness of our approach we perform a sensitivity analysis based on these findings.

II.1.5.1 Data Collection

There are various possibilities of how to acquire genuine values for the theoretically developed input parameters. Publicly available data e. g. by the Federal Statistical Office, other public or scientific institutions or historic and current intra-corporate data (e. g. in a data warehouse) are viable sources. Also conducting studies or consultations of external experts (e. g. interview of stakeholders) allows defining the input parameters. Furthermore, for the specific sustainability context almost all of the frameworks introduced in Tab. II-6 of the Appendix (e. g. the Global Reporting Initiative, the environmental management systems) provide sustainability indicators that can offer guideline on how to determine the necessary input parameters of our decision model.

The regarded company has already been awarded for its customer focus and innovative business model and states, e. g. in its annual reports and on the company homepage that sustainability plays an important role for its success. Experts from different business areas of the company (amongst other IT, market management, and executive management) helped us to reflect on the approach and to collect data for the input parameters. Although the subject-matter experts were willing to participate in the evaluation of the current status and the practices we were not able to cope with the complexity of the entire existing sustainability issues. We faced the following major challenges: Transforming the experiences with sustainability projects into functions is not straightforward and complex interrelations may

need to be simplified. The same holds true for the synergies and rivalries between corporate activities and the dimensions of sustainability. Nevertheless, we gained valuable insights into the difficulties encountered during data collection and analysis regarding whether the decision model creates utility. To sum it up, with consulting internal experts of the regarded company we determined parts of the input parameters. Those input parameters however that could not directly be assessed in the interviews were estimated based on other publicly available data and the aforementioned scientific sustainability frameworks.

II.1.5.2 Identification of Sustainability Actions and corresponding Starting Points

In a first step, the so far only abstractly defined perspectives of the *Sustainability Maturity Cube* (Corporate Activities, Sustainability Maturity Levels) have to be substantiated. The company chooses Porter's value chain to structure the corporate activities (1st perspective), and the sustainability maturity model of Cagnin et al. (2005) whose sustainability maturity levels develop from ad hoc (1), Planned in Isolation (2), Managed with No Integration (3), Excellence at Corporate Level (4), to High Performance Sustainability Net (5) (2nd perspective). Hence, we have: $m_{ij}^{min} = 1$ and m_{ji}^{max}=5.

For the instantiation of the *Sustainability Maturity Cube*, several more issues need to be considered: To analyze the current sustainability maturity level in the regarded company we had a look at corporate strategy and its operationalization: As maximum customer benefit is a main corporate goal, its products are designed to help its customers to operate in a sustainable manner. The interviews conducted allowed us to break this strategic goal down to the different dimensions of sustainability. The company is involved in the following sustainability actions and we were hence able to identify the following corresponding starting points:

- Regarding the ecological commitment, constant improvement of the products with a view to reducing the consumption of power, water and all resources that are involved in the use and production of the products is most important (starting point is corporate activity "operations" and ecological dimension).
- Social commitment is achieved by acting responsibly towards employees which means an appropriate work-life balance and direct participation of employees in the success of the company (starting point is corporate activity "outbound logistics" and social dimension).

- Further social commitment is achieved by actively supporting social and cultural activities in the region (starting point is corporate activity “infrastructure” and social dimension).
- Considering the economic dimension, the following findings were deduced from the interviews: For the regarded company sustainable and long-term economic activity is more important than achieving short-termed profits. This is reflected in a high customer satisfaction, which ultimately results in the continuous growth of sales and profits, and in a high employee satisfaction.

As the interviews revealed that the company did not yet focus on specifying the definite starting points regarding the dimensions of sustainability, the subject matter experts were asked for their indications of the sustainability maturity levels of the corporate activities. For each corporate activity, the questions considered not only the assessment of the current state of sustainability within the company (number of measures applied, evaluation of level of management involvement) but also its expected potential (number of measures approved or planned). The survey was conducted on a five-step Likert scale (1 = low; 5 = high), which allows to translate the answers into sustainability maturity levels. Considering the varying answers of the experts from different business areas, the aggregated current sustainability maturity levels of the corporate activities (weighted average over all answers from the experts) were defined as follows:

C_1: Operations ($m_1^{cur} = 1.00$)

C_2: Outbound Logistics ($m_2^{cur} = 1.00$)

C_3: Infrastructure ($m_3^{cur} = 1.67$)

II.1.5.3 Determination of the economically optimal Increase of the Sustainability Maturity Levels

To derive the economic consequences, the investments, cash outflows, savings, and cash inflows have to be estimated according to the business cases the company had developed for single sustainability decisions. We assume that each component of the total additional payments surplus $CF(\overrightarrow{\Delta m})$ is characterized by the previously proposed gradient e. g. quadratic and root functions and hence we define exemplary functions. We further assume that investments, cash outflows of operational business and savings only depend on the aggregation function $g(\overrightarrow{\Delta m_i})$ with $\overrightarrow{\Delta m_i} = (\Delta m_{i1}, \Delta m_{i2}, \Delta m_{i3})^T$ and hence potential synergies or rivalries between the different dimensions of sustainability within one corporate activity are already considered. Additionally, the cash inflows depend on the total (company-wide, overall corporate activities) sustainability maturity level formalized by aggregation function $f(\overrightarrow{\Delta m})$ with $\overrightarrow{\Delta m} = (\overrightarrow{\Delta m_1}, \dots, \overrightarrow{\Delta m_n})^T$ which aggregates the total sustainability maturity level regarding the synergies and rivalries between different corporate activities.

In the regarded company where we had already defined the current sustainability maturity levels of the corporate activities C_1: Operations ($m_1^{cur} = 1.00$), C_2: Outbound Logistics ($m_2^{cur} = 1.00$), and C_3: Infrastructure ($m_3^{cur} = 1.67$), the experts from different business areas helped us to determine the parameters of the components of the total additional payments surplus $CF(\overrightarrow{\Delta m})$. We assume the functions as shown in Tab II-2:

Tab. II- 2 Continuous Functions based on $\mathbf{m_i^{cur}}$

i	**Investment** $I_i^{cur}(g(\overrightarrow{\Delta m_i}))$	**Cash outflows of operational business** $O_i^{cur}(g(\overrightarrow{\Delta m_i}))$	**Savings** $S_i^{cur}(g(\overrightarrow{\Delta m_i}))$	**Cash inflow** $E^{cur}(f(\overrightarrow{\Delta m}))$
1	$9 \cdot \Delta m_1{}^2 + 2 \cdot \Delta m_1$	$5 \cdot \Delta m_1{}^2 + 4 \cdot \Delta m_1$	$7 \cdot \Delta m_1{}^{0,5}$	$185 \cdot \sqrt{(f(\overrightarrow{\Delta m}))}$
2	$7 \cdot \Delta m_2{}^2 + 5 \cdot \Delta m_2$	$3 \cdot \Delta m_2{}^2 + 7 \cdot \Delta m_2$	$10 \cdot \Delta m_2{}^{0,5}$	
3	$4 \cdot \Delta m_3{}^2 + 8 \cdot \Delta m_3$	$2 \cdot \Delta m_3{}^2 + 9 \cdot \Delta m_3$	$8 \cdot \Delta m_3{}^{0,5}$	

The calculation of the optimal increase of the sustainability maturity level can be implemented e. g. in Microsoft Excel. For the given company and the regarded circumstances the following results are achieved (rounded values): Δm_1=0.40, Δm_2=0.66 and Δm_3=0.68.

The payments surplus is thus 16.88 TEUR. By investing 41.25 TEUR in total, cash inflows of 75.67 TEUR, cash outflows of operational business of 27.77 TEUR, and saving of 10.23 TEUR can be achieved. For the regarded company it is thus economically useful to aim at increasing all of the regarded maturity levels. Here, the biggest potential lies in the corporate activity "infrastructure" – even though this activity is already at a higher maturity level compared to the others.

II.1.5.4 Analysis of the Decision Model Behavior conducting a Sensitivity Analysis

Acquiring reliable real-world data to profoundly examine the benefits of our theoretic approach is rather difficult in the multi-faceted context of sustainability. Furthermore, estimated parameter values and assumptions are generally subject to change and error (Pannell 1997). We therefore analyze the behavior of our decision model regarding sustainability decisions in detail by performing a sensitivity analysis. This is a common method from decision-making theory and aims on examining how sensitive a model's results are to changes in the input variables (Kim et al. 2009; Pannell 1997; Saltelli et al. 2008; Triantaphyllou and Sánchez 1997).

In the basic form of a sensitivity analysis, the value of a certain input parameter is varied within a specific range around the best guess value (see above) while keeping all other input parameters constant (Pannell 1997; Saltelli et al. 2008). In our analysis we change each input parameter by plus respectively minus 10% compared to its original value estimated by the experts while keeping all other input parameters constant, and repeat this procedure with every input parameter of interest. In order to abstract from the effects that result from the different sizes of the input parameters, we complement the analysis by changing the input parameters in their absolute size by plus respectively minus 1. The major objectives thus are to test the robustness of the decision model's results regarding the parameterization of certain input values and to gain a deeper understanding about the relationships between input parameters and the outcome.

We show the results of the described sensitivity analysis for one exemplary corporate activity (C1: Operations). This restriction is legitimate as the behavior of all corporate activities resembles one another due to the same nature of the underlying functions. The results are presented in Tab. II-3. In the first column, we listed the initial values for the input parameters as estimated by the experts (also cf. Tab II-2, first line for corporate activity C1). The

subsequent columns contain the changed results according to the variation of the input parameters for the sum over all corporate activities for each of the following components: investments (cf. column 3), cash outflows of operational business (cf. column 4), savings (cf. column 5) and cash inflows (cf. column 6) followed by the resulting total additional payments surplus (cf. column 7), and the respective relative change in the total additional payments surplus (cf. column 8). Each row thereby consists of two sub-rows. The upper sub-row contains the results when the parameter value is increased and decreased by 10% relative to the initial value (cf. column 2). The lower sub-row contains the results of an absolute parameter variation of plus and minus 1 (cf. column 2).

Tab. II-3 Sensitivity Analysis

Input parameter: original value	Modified values (+/-10%, +/-1)	Investments	Cash outflows of operational business	Savings	Cash inflows	Resulting total additional payments surplus	Relative change in total additional payments surplus
a: 9	9,9	40,63	26,91	9,96	73,69	16,10	-5%
	8,1	41,76	28,83	10,53	77,89	17,84	6%
	10	40,56	26,82	9,93	73,48	16,03	-5%
	8	41,80	28,96	10,56	78,16	17,96	6%
b: 2	2,2	41,21	27,70	10,20	75,50	16,79	0%
	1,8	41,28	27,85	10,25	75,83	16,95	0%
	3	41,06	27,40	10,11	74,83	16,49	-2%
	1	41,40	28,16	10,34	76,50	17,28	2%
j: 5	5,5	40,50	27,69	10,07	74,54	16,42	-3%
	4,5	42,09	27,79	10,39	76,87	17,38	3%
	6	39,83	27,55	9,93	73,48	16,03	-5%
	4	43,04	27,72	10,56	78,16	17,96	6%
k: 4	4,4	41,02	27,78	10,18	75,33	16,71	-1%
	3,6	41,48	27,76	10,27	76,00	17,03	1%
	5	40,69	27,77	10,11	74,83	16,49	-2%
	3	41,83	27,73	10,34	76,50	17,28	2%
r: 7	7,7	41,66	28,04	10,59	76,26	17,16	2%
	6,3	40,84	27,51	9,86	75,07	16,58	-2%
	8	41,83	28,15	10,75	76,51	17,28	2%
	6	40,67	27,39	9,71	74,82	16,46	-2%
s: 185	203,5	52,16	34,87	12,28	99,96	25,20	49%
	166,5	30,66	20,78	8,03	53,51	10,10	-40%
	186	41,83	28,15	10,34	76,93	17,28	2%
	184	40,67	27,39	10,11	74,41	16,46	-2%

The conducted analysis allows us to draw the following conclusions:

- The direction of the changes of the total additional payments surplus is as expected from an analytical point of view: an increase (decrease) of the cash outflows leads to a decrease (increase) of the total additional payments surplus and vice versa for the cash inflows. Here, increased (decreased) savings or increased (decreased) cash inflows lead to an increased (decreased) total additional payments surplus.
- Furthermore, the result of our decision model is quite robust for our real-world example: The relative change in the total additional payments surplus is generally small and considerably lower than the 10% variation of the respective input parameter except for the

case of the expected cash inflows. Here, the variation of *s* by +/- 10% results in a 49% (-40%) increase (decrease) of the total additional payments surplus. This can be explained by the high absolute value of the input parameter s compared to all other input parameters. One reason might be the fact, that in contrast to all other input parameters, the cash inflows are the only component in our example that depends on the aggregated total sustainability maturity level (cf. aggregation function $f(\overrightarrow{\Delta m})$) over all corporate activities, whereas the other input parameters only contain the effects of just one corporate activity (cf. aggregation function $g(\overrightarrow{\Delta m_i})$). Another reason to justify this comparably high value of the cash inflows is the fact that the customer equity which is the main building block of this cash flow component is a future-oriented figure that includes long-term effects.

In order to abstract from this relative size effect, we furthermore examined the absolute variation of the input parameters (cf. the lower two sub-rows for each input parameter in table 3). The same absolute variation of +/- 1 for all input parameters results in a similar low variation of the total additional payments surplus (cf. column 7 and 8). This also holds true for the variation of the input parameter s (cf. variation of the total additional payments surplus of + 2%/-2%).

Hence, when estimating the cash inflows, special attention has to be paid to the consequences of misestimating long-termed effects like customer-related issues, as these can be higher than rather short-termed ones. Moreover, as the cash inflows depend on the aggregated function over all corporate activities, these can be higher than the other components that only focus on single corporate activities and consequently have a considerable stronger effect on the model results.

In the previous analysis we only focused on the variation of the input parameters of one corporate activity (C_1: Operations) within the three examined corporate activities. As the same experts were asked to assess the current state of sustainability for all corporate activities, this restriction on one corporate activity is legitimate. Even more, the direction of effects on the model output remains the same independently of the considered corporate activity due to the equal nature of their underlying functions. However, when estimating the input parameters it is possible that the experts over- or underestimate not just one, but for example the same input parameter for all corporate activities at the same time, which consequently leads to stronger effects regarding the change of the output. Moreover, in order to consider that humans in dependence of their attitude towards risk tend to be rather optimistic or pessimistic regarding

future cash flows, we applied one optimistic and one pessimistic scenario besides the presented base case scenario to further complement the analysis. We deduce the values for the optimistic and pessimistic scenario as follows: in the optimistic case, we expect the experts to underestimate the investments and cash outflows of operational business while overestimating the cash inflows and savings at the same time by 10% each for all three examined corporate activities. For the pessimistic case, we expect the experts to overestimate the investments and cash outflows of operational business while underestimating the cash inflows and savings by 10% each for all three examined corporate activities. Tab II-4 summarizes the results of this scenario analysis.

Tab. II-4 Scenario Analysis

Base case (original input parameters)						Investments	Cash outflows of operational business	Savings	Cash inflows	Resulting total additional payments surplus	Relative change in total additional payments surplus
9	2	5	4	7	185						
7	5	3	7	10	185	41,25	27,77	10,23	75,67	16,87	
4	8	2	9	8	185						
Optimisitc case (underestimation of cash outflows, overestimation of cash inflows)											
8,1	1,8	4,5	3,6	7,7	203,5						
6,3	4,5	2,7	6,3	11	203,5	62,42	41,29	16,71	123,63	36,63	**117%**
3,6	7,2	1,8	8,1	8,8	203,5						
Pessimistic case (overestimation of cash outflows, underestimation of cash inflows)											
9,9	2,2	5,5	4,4	6,3	166,5						
7,7	5,5	3,3	7,7	9	166,5	21,74	14,81	4,97	36,80	5,23	**-69%**
4,4	8,8	2,2	9,9	7,2	166,5						

We can see that the relative change in the total additional payments surplus is quite substantial (cf. +117% and - 69%). This can be explained by the fact that compared to the analysis presented above where we focused on just one input parameter at a time, now all eighteen input parameters are misestimated by 10 % each at the same time. In the pessimistic scenario, the total additional payments surplus decreases only by 69%, which is quite low compared to the increase of 117% in the optimistic case. We can thus see that in our current case, a pessimistic estimation of cash in- and outflows leads to a lower change of the total additional payments surplus than an overly optimistic estimation of the respective input parameters does. When taking into account other current sustainability maturity levels for the corporate activities other results may be obtained and other conclusions can be drawn. This can be explained by the following: Depending on the gradient of the convex cash outflow and concave cash inflow functions and the respective starting point on the functions (i. e. current sustainability maturity levels) the same relative change of the input parameters for cash in- and outflows can lead to different results regarding the strength of the change on the output.

In the regarded case, the base case scenario is characterized by the fact that it is economically useful to aim at increasing all of the regarded maturity levels (i. e. current maturity levels located on the left side of the optimum). Hence, the underestimation of the convex cash outflows (leading to a lower gradient of the curve) and the overestimation of the concave cash inflows (also leading to a lower gradient of the curve) lead to a higher value of the total additional payments surplus in the optimum (optimistic case). In contrast, in the pessimistic case, both gradients of the functions increase, causing that the optimum for the estimated parameter values is reached with a lower increase in maturity levels than in the optimistic case.

The results of the presented analysis can build the basis for the transformation towards sustainability in the regarded company. Altogether, the proposed *Sustainability Maturity Cube* as a blueprint, as well as the adapted decision model of Kamprath and Röglinger (2011) created utility for the subject matter experts as they provided them with recommendations and means for further analysis (e. g. careful estimations, short-termed vs. long-termed effects, effects of different absolute sizes of input parameters). They also helped to systematize the decision processes. The presented approach thus allows aligning ecological, social, and economic objectives and drawing economically reasonable conclusions in this context by determining the optimal increase of the sustainability maturity level.

II.1.6 Contribution, Limitations, and Conclusion

In order to maintain our current style of life, we would need the equivalent of two of our today's planets by 2030 (Buhl and Jetter 2009). Statements like this and the knowledge of scarce resources as well as the existence of more and more sensible customers (cf. LOHAS) emphasize the necessity to integrate sustainable behavior into individual and corporate activities and decisions. Although it bears great potential for economic improvement, still little research exists in the field of the comprehensive concept of sustainability and how companies should engage in sustainability transformations.

With the presented *Sustainability Maturity Cube* as a blueprint and the decision model at hand, we contribute to theory and practice: It was our objective to integrate ecological, social, and economic objectives into corporate decisions. We first showed how organizations can structure the field of action, and suggested possible starting points within corporate processes where to implement sustainability actions (via analyzing the entire business system following

Porter's value chain model) for all three dimensions of sustainability. Since implementing sustainability is characterized by continuous development, we adapted the basic idea of stages of development and maturity to sustainability context, in order to provide a possibility to describe the respective sequence of levels that form an anticipated path from an initial state to maturity. The resulting *Sustainability Maturity Cube* is a blueprint that is based on acknowledged scientific concepts to support the systematic improvement of sustainability management by considering certain corporate activities, the three dimensions of sustainability, and the corresponding stages of development (Research Question 1). Being a blueprint, it can be instantiated and hence provides the basis for developing concrete sustainability maturity models.

The second contribution is the proposed decision model that allows identifying the economically optimal increase of the sustainability maturity level of each identified corporate activity and each dimension of sustainability respectively (Research Question 2). Our approach thereby represents a first step to align decisions regarding the transformation towards sustainability with the paradigm of value-based management, taking into account the ambiguous role of the economic dimension in business context. Finally, the instantiation of the blueprint and the applicability of the decision model were illustrated by the example of a German medium-sized company and tested for its robustness, performing a sensitivity analysis. Overall, the approach delivers a contribution to theoretical and practical knowledge in the multidisciplinary research field of transformation towards sustainability and, in parallel, offers a basis or starting point for further research.

Besides the previously highlighted benefits, our approach offers scope for discussion and implicates limitations:

- The difficulties regarding a clear definition, understanding and operationalization of (corporate) sustainability show that sustainable development is a complex and multidimensional issue. Hence, a clear and unambiguous managerial advice cannot be given. The understanding of corporate sustainability in this paper is based on the belief that the economic perspective is of particular importance in a business context and can be seen as ambiguous. On the one hand, it is one of the three sustainability dimensions, but at the same time – in conformity with the paradigm of value-based management emerges as an additional organizational incentive when engaging in sustainability

transformation. This explains the understanding of corporate sustainability for this work, however, future research needs to further dispute this controversy.

- The empirical evidence of whether all customers care about sustainability issues and express their concerns through purchasing behavior and thus price sensitivity is debatable. Even those customers, who say they care about sustainability, do not necessarily reflect their attitude in their purchasing habit (cf. Bonini and Oppenheim 2008; Bellows et al. 2008; Fisher 1993; Pickett-Baker and Ozaki 2008). As a consequence sustainable practices may directly and negatively affect profitability, and organizations may refrain from diving into adopting sustainable practices.
- Determining the concrete monetary values of the consequences of sustainability actions is not straight forward as there does not always exist a metric that can be estimated: In some cases one of the numerous frameworks of sustainability assessment can provide assistance in determining such sustainability metrics but this may not be always reliable. Hence, some of the values depend on the estimation of subject matter experts. An objectification is desirable but would require further research.
- There are several issues that have to be considered when instantiating a concrete sustainability maturity model, such as the determination of current and targeted sustainability maturity levels, the formulation of concrete development paths from initial to desired maturity levels, confounding effects (e. g. when implementing several actions at the same time), and situations when it makes sense to invest in a particular action or not. We addressed some of these aspects in the operationalization of the approach, however further research needs to focus on guidelines for the operationalization of the *Sustainability Maturity Cube*.
- Future research should also focus on a more extensive evaluation of the proposed approach as we only used an illustrative case for the operationalization. Even though this case allows for an initial instantiation of the *Sustainability Maturity Cube*, the findings are not aimed at making generalizations.

These limitations provide room for further research in this area. Nevertheless, our approach delivers insights in the assessment of sustainability and may serve as a first step towards integrating sustainability into organizations and corporate decision-making.

II.1.7 Appendix

Tab. II-5 Tools and Management Approaches for the Integration of Sustainability into Organizations

	Approach	Description	Strengths	Weaknesses
Quality and Environmental Management Systems	ISO 14000	Standards related to environmental management to help organizations on how to minimize negative effects of their operations (processes etc.) on the environment.	•High conformance with legislative and regulatory requirements. •Internationally recognized standard.	•Lack of measurement and evaluation of environmental performance against objectives and targets. •Lack of employee involvement.
	ISO 9000	Standards related to quality management systems designed to help organizations ensuring that they meet the needs of customers and other stakeholders while meeting statutory and regulatory requirements related to the product.	•Comprehensive model for quality management systems.	•Time and labor intensive registration process.
	EMAS (Eco-Management and Audit Scheme)	Voluntary environmental management instrument to assess, manage and continuously improve environmental performance.	•Globally applicable and open to all types of private and public organizations. •Environmental performance can be reviewed and tracked regularly. •The use of indicators allows for consistent monitoring and reporting.	•Social implications are not considered.
Environmental Management Tools	GRI Guidelines	Guidelines that assist reporting organizations and their stakeholders in articulating and understanding contributions of the organization to sustainable development through their reports.	•Holistic framework that addresses social, environmental and economic performance. •Globally applicable and open to all types of private and public organizations. •Allows to measure and benchmark performance, both against own targets and externally.	•Labor intensive implementation process. •Guidance, but not accreditation unless combined with other tools, such as an assurance standard.
	Environmental accounting	Incorporation of both economic and environmental information into accounting.	•Complete costs (including environmental remediation and long-term environmental consequences and externalities) can be quantified and addressed.	•Social implications are not considered.
	Life-cycle Assessment	Technique to assess environmental impacts associated with all stages of a product's life cycle.	•Holistic assessment of environmental impact. •Identification of environmental consequences.	•Social implications of products are not considered.
	Environmental Reporting	Systematic and holistic statement of environmental burden and	•Strengthening voluntary environmental efforts in	•Social implications are not considered.

		environmental efforts in organizations' activities.	organizations activities.	
	Sustainable (Product) Design	Design with the intention to eliminate negative environmental impact completely through skillful, sensitive design.	•Creation of meaningful innovations that can shift behavior.	• Lack of measurement and evaluation of environmental performance against objectives and targets.
	Green Marketing	Marketing of products that are presumed to be environmentally safe.	• Involvement of the customer • Raises awareness for environmental consequences.	•Misleading or overstated claims can lead to regulatory or civil challenges. •Risk of "greenwashing".
Social Management Tools	AA1000	Development of tools that enable individuals, institutions and alliances to respond better to global challenges.	•Development in a multi-stakeholder process. •Compatibility with other sets of principles in the marketplace, such as the UN Global Compact, GRI and ISO 26000.	
	SA8000	International standardized code of conduct for improving working conditions around the world.	•Principles of thirteen international human rights conventions build the basis. • Development in a multi-stakeholder process. •Provision of public report of good practice to consumers, buyers, and other companies.	•Environmental implications are not considered.
	Social Auditing	Approach to reporting a firm's activities which stresses the need for the identification of socially relevant behavior, the determination of those to whom the company is accountable for its social performance and the development of appropriate measures and reporting techniques.	• Raises awareness for social consequences.	•Environmental implications are not considered. • Lack of measurement and evaluation of environmental performance against objectives and targets.
Measurement Tools	Sustainability Balanced Scorecard	Incorporate environmental and social aspects into the main management system of a firm.	•Overcomes the shortcomings of conventional approaches to environmental and social management systems by integrating the three pillars of sustainability into a single and overarching strategic management tool. •Allows for the measurement and evaluation of environmental performance against objectives and targets.	• Specification for application in individual company is necessary in order to achieve targeted actions.
	Sustainability Maturity Models	Sustainability maturity models can be used to objectively evaluate a company's initial and evolving states with regards to sustainability and give organizations a vital tool to	•Holistic framework that addresses social, environmental and economic dimension of sustainability.	• Current state and target state have to be identified in advance •Focus on sustainability measures rather than on products or services

		manage their sustainability capability.		•Specification for application in individual company is necessary in order to achieve targeted actions
Applied Concepts	Green Supply Chain	Extension of traditional supply chains to include activities that aim at minimizing environmental impacts of a product throughout its entire life cycle, such as green design, resource saving, harmful material reduction, and product recycle or reuse.	•Raises awareness for environmental consequences of a product. •Consideration of the entire life cycle	•Social implications are not considered.
	Sustainable Tourism	Attempt to minimize impact on the environment and local culture, while helping to generate future employment for local people. The aim of sustainable tourism is to ensure that development brings a positive experience for local people, tourism companies and the tourists themselves.	•Holistic framework that addresses social, environmental and economic dimension of sustainability	• Limited application area
	Sustainable Infrastructure	Sustainable infrastructure refers to the design, building, and operating of structural elements in ways that do not diminish the social, economic and ecological processes required maintaining human equity, diversity, and the functionality of natural systems.	•Holistic framework that addresses social, environmental and economic aspects.	•Limited application area
	Sustainable Customer Relationship Management	Holistic integration of economic, environmental, and social sustainability issues into the strategic, operational, and analytical areas of CRM	•Holistic framework that addresses social, environmental and economic performance.	•Limited application area

Tab. II-6 Exemplary Range of different Sustainability Maturity Models found in Research and Practice with respective core Application Area (second Line) and according Definitions regarding Sustainability Maturity Levels (Lines three to seven)

Maturity Level	**Cagnin, Loveridge, and Butler, 2011**	**Kirkwood, Alinaghian, and Srai, 2008**	**Zarnekow and Erek, 2008**	**Object Management, Group 2009**	**Silvius and Schipper, 2010**	**Mani, Lyons, and Sriram, 2010**	**Curry and Donnellan, 2012**
Application Area	Business	Supply Networks (network design)	Information Management	Business	Project Management	Manufacturin	Information and Communication Technology
1	Ad hoc	Accidental/ Initial	Ad hoc	Ad hoc	not existing	Initial	Initial
2	Planned in Isolation	Repeatable	Conscious	Defined, Documented and Architected	Resources	Repeatable	Basic
3	Managed with No Integration	Defined	Established	Repeatable and Governed	Business Processes	Defined	Intermediate
4	Excellence at Corporate Level	Managed	Quantitatively controlled	Optimized and extensible	Business Model	Quantitatively managed	Advanced
5	High Performance Sustainability Net	Mastered/ Optimized	Optimized	Demonstrable ROI of Green Initiatives	Products and Services	Optimizing	Optimizing

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II.2 Beitrag 2: „Sustainability and Customer Relationship Management - Lines of research and success factors" [1]

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Zusammenfassung:

As recent years have seen an on-going discussion in science and industry about customer relationship management on the one hand and sustainability on the other hand, the synthesis of both trends sustainability and customer relationship management is gaining increasing importance. Within the multiplicity of scientific publications exploring sustainability in customer-related areas, this paper provides an overview on the current state of research on sustainability and customer relationship management. We analyse the present literature predominately with regard to the core areas of CRM, i.e. marketing, sales, and service. It becomes evident that almost no research takes an integrated perspective on what shapes sustainability activities targeted at the customer and analyses how customers and sustainability interdigitate. As hardly any research has dealt with the comprehensive concept of sustainability and customer relationship management we furthermore deduce future research opportunities. Thereby we analyse what enables and empowers sustainability and customer relationship management initiatives and how these can be further advanced and improved.

[1] The final publication is available at http://link.springer.com. (http://link.springer.com/article/10.1007/s11301-014-0104-x)

II.2.1 Introduction

A recent and rapidly growing trend in management has been to place the customer at the centre of corporate strategy (Martin 2010), based on the insight that customers are the basis of company profitability (Gupta et al. 2004; Hogan et al. 2002). So-called customer-centric approaches have started to redefine customer relationship management (CRM), stipulating that the ability to sense and respond to customer concerns can increase company profit and is therefore essential to its survival (Crittenden et al. 2011). Current mega-trends such as demographic changes, digitalization and sustainability (Lubin and Esty 2010) influence the mind-set and behaviour of customers. In particular, growing concerns with the scarcity of natural resources, environmental degradation, and social inequalities have led to consumers becoming aware of the impact that current patterns of production, consumption and living are having on future sustainability (Silvius and Schipper 2010). With customers seeking to play a role in the transformation towards more sustainable lifestyles, companies need to respond to these developments, e.g. by cultivating markets that balance profitability with environmental and social responsibility (Graham and Havlick 1999). One of the key driving forces in this movement is the consumer group LOHAS (Lifestyle of Health and Sustainability), which represents an emerging culture advocating personal health and environmental sustainability in the marketplace (Ray and Anderson 2000). Companies hence need to serve the new and constantly evolving needs of the growing number of customers who deeply care about social and environmental issues, who are willing to pay more for sustainable products, and who act as role models in educating wider society towards a better future.

In literature, various approaches have been taken to explore the trends in CRM and sustainability. To date, however, there has been very little research that provides an integrated perspective on the underlying mechanisms that shape sustainability-oriented CRM activities and that analyses how customers and sustainability interdigitate (Basu and Palazzo 2008). Similarly, research dealing with the comprehensive concept of sustainability-oriented CRM is limited (Ruhwinkel and Wilde 2011). Hence, the aim of this paper is to provide a theoretical foundation for the current state of research on sustainability-oriented CRM, which we define as the holistic integration of economic, environmental, and social sustainability issues, and the core areas of CRM, i.e. marketing, sales, and services. Below, we introduce two research questions that will contribute to a better understanding of the body of knowledge regarding sustainability and CRM:

RQ 1: How can the findings from existing research contribute to the understanding of sustainability-oriented CRM?

RQ 2: Which opportunities for future research can be identified in current research?

To answer these questions, we follow the accepted research process for literature reviews (Cooper and Hedges 1994; Tranfield et al. 2003; Webster and Watson 2002). We believe that the growing number of publications in this field need to be analysed and synthesized to identify research gaps that can be addressed in future research (Webster and Watson 2002). This process typically includes the following phases: (i) problem formulation, (ii) identification of relevant literature, (iii) evaluation of identified literature, (iv) analysis, interpretation, and discussion, and (v) public presentation. Having formulated the problem of interest by raising research question RQ 1 (phase i), in Section 2, the main criteria for the analysis (i.e. the core areas of CRM and the dimensions of sustainability) are deduced from the theoretical foundations of CRM and sustainability. In Section 3, we elaborate on our evaluation of the literature in order to identify existing CRM research that has focused on sustainability (phases ii and iii). We then compile the key findings regarding sustainability-oriented CRM and analyse the identified literature according to the criteria (phase iv) in Section 4. The results of this process are presented in table A in the web appendix (phase v). Moreover, the development and current state of related research is analysed with regard to opportunities for future studies in Section 5 (RQ 2). In Section 6, we briefly summarize the key findings.

II.2.2 Theoretical foundations

Both CRM and sustainability are multifaceted constructs, whose nature and origin are further elaborated below. We start by defining CRM (2.1) and continue with a detailed explanation of sustainability (2.2). Finally, the definition of sustainability-oriented CRM is presented (2.3).

II.2.2.1 Foundations of customer relationship management

The idea of CRM goes back to relationship marketing, which was introduced by Berry (1983), Christopher et al. (1991), Gronroos (2000), and Morgan and Hunt (1994). In the past two decades, marketing has evolved from a product- and transaction-oriented process to a customer- and relationship-oriented approach, with increasing focus on long-term customer relationships, both in research and in practice (Elmuti et al. 2009; Håkansson 1982; Reinartz et al. 2004; Storbacka 1994). With the development of IT and the focus on the customer –

basic relationship marketing deals with all stakeholders, not only customers – CRM has emerged from a synthesis of relationship marketing and different research streams within marketing and business information systems. Newly available data, technologies, and organizational forms have contributed to this development (Boulding et al. 2005; Payne and Frow 2006).

There is no single definition of CRM and, hence, the definition depends on the perspective taken. From the relationship perspective, CRM focuses on establishing, maintaining, and enhancing long-term relationships with customers (Jayachandran et al. 2005), and can be defined as "the overall process of building and maintaining profitable customer relationships by delivering superior customer value and satisfaction" (Kotler and Armstrong 2004, p. 16). As a business strategy, "CRM is a customer-focused business strategy that aims at increasing customer satisfaction and customer loyalty by offering more responsive and customized services to each customer" (Croteau and Li 2003). It is also a strategic initiative intended to create improved shareholder value via profitable and long-term customer relationships by aligning the activities of sales, marketing, and service departments, and by employing modern IT systems (Goodhue et al. 2002; Payne and Frow 2005). The objective of profitable and long-term customer relationships requires those relationships to be treated as assets or investments that need to be actively managed in order to maximize corporate value (Gneiser 2010). All CRM activities and decisions must therefore be consistently linked to the goal of maximizing long-term shareholder value (Rao and Bharadwaj 2008). Furthermore, the strategic direction for customer activities needs to be defined (strategic CRM processes), customer information needs to be consolidated and analysed systematically (analytical CRM processes), and the central operational CRM processes in the core areas of CRM, i.e. marketing, sales, and service, have to be synchronized (Leußer et al. 2011). Of all of the central tasks of CRM, the operational CRM processes in the core areas of marketing, sales, and service are of special interest for this paper, as they are the focal points of the customer's relationship with the company.

II.2.2.2 Nature and origin of sustainability

There are multiple definitions of sustainability (cf. Hoffman and Bazerman 2007), but the one most commonly used stems from the Brundtland Commission and defines sustainability as a "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987). The preservation of economic,

ecological, and social systems for the benefit of future generations represents the three main "pillars" of sustainability and is known as the "triple bottom line" concept (Elkington 1997). The Center for Sustainable Enterprise (2010) considers the pillars indirectly when defining sustainability as "a way of doing business that creates profit while avoiding harm to people and the planet". This definition conceptualizes sustainability in terms of the reduction of negative externalities and neglects the creation of positive effects (e.g. improving living conditions). In this article, we follow Elkington (1997) and view sustainability as the triple bottom line of economic profitability, respect for the environment, and social responsibility (Boyd 2001; Johnson 2009). These three dimensions of sustainability can be viewed as the basis for integral market-oriented resources, capabilities, and competitive advantage (Hunt and Morgan 1995; Slater and Narver 1995). The environmental dimension predominantly focuses on preservation of natural resources (Bansal 2005; Hart 1995), while the social dimension describes the need for firms to consider their impact on society and to address issues such as community relations, education support, and charitable contributions (Elkington 1997; Wood 1991). Other topics related to social responsibility include corporate giving and community involvement, as well as the company's position on issues involving women, ethnic minorities, gays and lesbians, and disabled individuals (Bhattacharya and Sen 2001). The economic dimension centres on value creation and the financial impact of a firm's sustainability activities (Bansal 2005). These dimensions are connected in different ways and there are various beliefs regarding those connections. Therefore, increased knowledge and awareness of the connections and interactions among these three ''pillars'' of sustainability, and of all of the issues encompassed by the concept of sustainability, is needed (Hutchin and Sutherland 2008). The interrelatedness of the dimensions also means that terms such as green, environmental, sustainable, ethical, or ecological might be used interchangeably, even though they can have varying connotations for different audiences (Peattie 1995). Generally, "sustainability initiatives run the gamut from changing the façade (advertising and packaging that promotes green products/services) to radical changes in business procedures (marketing focus, where facilities are located, how products/services are delivered), and how employees, customers, suppliers, and other stakeholders are treated throughout the process" (Closs et al. 2011, p. 101). Hence, sustainability-related activities within corporations can be categorised into the following fields: production (i.e. logistics, technical decisions), product (i.e. products or services and their effect throughout their life cycle), and management (Dyllick 2003, p.

241). In the regarded context of sustainability-oriented CRM, we focus on two of these fields, “product” and “management”.

II.2.2.3 The concept of sustainability-oriented CRM

The basic idea of sustainability-oriented CRM is integrating the economic, environmental, and social sustainability issues in the core areas of CRM, i.e. marketing, sales, and service. Since both trends (CRM and sustainability) are currently shaping business strategies, changing operations, and fostering competition, regarding them in an integrated manner is meaningful. Both building blocks contribute essentially to the comprehensive concept: Sustainability provides the fundamental values and strategy issues that are rarely addressed within CRM, which contributes established processes and structures (Ruhwinkel 2013). Making an allowance for sustainability issues in CRM strategy and in the CRM processes leads to differentiation from competitors and helps ensure the continuity of business operations, as the ecological and societal limits are considered (Ruhwinkel 2013). Sustainability-oriented CRM, therefore, means considering economic, ecological, and social targets when establishing and maintaining long-term profitable customer relations. More specifically, it is the aim of sustainability-oriented CRM to increase consumer awareness of corporate sustainability issues and to attract and retain sustainability-conscious customers. Being close to customers and understanding their needs through all phases of the relationship requires efficient and effective operational CRM processes in the core areas marketing, sales, and services.

In order to understand sustainability-oriented CRM, it is also crucial to distinguish it from other consumer-focused sustainability issues, such as sustainable consumption (Symposium Sustainable Consumption 1994), customer-centric sustainability (Sheth et al. 2011), market-based sustainability (Hult 2011), market-focused sustainability (Ketchen et al. 2007), and sustainable marketing (van Dam and Apeldoorn 1996). Most of these concepts are marketing-based and refer to the impact of marketing actions on the environmental, personal, and economic well-being of the consumer. In the context of sustainable marketing, “sustainable” refers to the continuity of the business and the duration of the customer relationship (Belz 2001). In addition to these rather broad concepts, there are specific sustainability-oriented customer constructs such as green consumption and socially conscious consumer behaviour. Regarding the ecological dimension, a green consumer is defined as anyone whose purchase behaviour is influenced by environmental concerns (Shrum et al. 1995). Green consumption

deals with purchase decisions made by consumers, based at least partly on environmental criteria (Peattie 1995). Green brand image is defined as "a set of perceptions of a brand in a consumer's mind that is linked to environmental commitments and environmental concerns" (Chen 2010). Green consumer satisfaction describes the fulfilment of some environmental need, goal, or desire that is pleasurable for the customer (Chang and Fong 2010). Socially conscious consumer behaviour (Roberts 2003) is consumer behaviour undertaken with the intention of having a positive (or less negative) effect on other people, and relates to issues such as labour rights and the impacts of businesses on the communities in which they operate (Pepper et al. 2009). Ethical socially responsible consumer behaviour is, however, defined as "tak(ing) into account the public consequences of his or her private consumption" (Webster 1975). All of these concepts – in contrast to sustainability-oriented CRM – address only individual elements and do not provide a comprehensive perspective on all of the core areas of CRM and all of the dimensions of sustainability.

II.2.3 Identification and description of relevant literature

II.2.3.1 Identification

Like other literature examinations (e.g. Fifka 2012), the following review uses a multi-dimensional classification to structure the literature. We conducted a focused web search of the online databases Proquest, ScienceDirect, and Google Scholar (http://scholar.google.com) using "sustainable/sustainability" or "environmental", "green" or "social", and "customer/consumer" as search terms, as well as title and abstract as search fields. These search terms are relatively broad and were chosen because a more restricted search using the terms "CRM/customer relationship management" and "sustainability/sustainable" led to only a few relevant results. Our search led to 246 core results. As our search procedure still yielded some un-related articles, ranging from those dealing with economic-focused topics such as a "sustainable competitive advantage" or very specialized sustainability-projects in industries such as construction or tourism, we screened the resulting hits for relevance. Our screening involved checking each result to see if its context focused on both customer-company or consumer-company and sustainability (based on the definition of the triple bottom line). We also conducted forward and backward reference searches. The review, therefore, does not only focus on journals from the CRM discipline, but includes, to the degree possible, journals in which studies on sustainability- and costumer-related topics have been published (e.g. Journal of Business Ethics, Journal of Cleaner Production, and Business Strategy and the

Environment). Concerning the research approach, not only empirical approaches but also conceptual articles (theoretical, normative, and prescriptive work) have been included in order to gain a comprehensive perspective on the topic of interest. Furthermore, only studies published in journals in the English language were considered. These delineations are necessary to be able to manage the large body of literature available. At the same time, it is important to note that this study does not claim to be fully comprehensive. Although every effort has been made to include all existing studies of relevance, it is likely that studies exist of which the authors are not aware. Finally, the scope of articles is limited to the ones published before September 2013. An overview of the 101 studies examined is presented in the appendix (Tab. II-8).

II.2.3.2 Description of relevant literature

The selected 101 articles can be described in terms of the analysed characteristics, the research approach, the samples examined, and the chronological development (numbers in brackets represent the number and percentage of papers identified).

II.2.3.2.1. Characteristics of sustainable consumers

The research that we reviewed examines the characteristics of sustainable consumers and describes different aspects of customer behaviour (e.g. Faiers et al. 2007; Laroche et al. 2001; Lee 2008; Pedersen and Neergaard 2006; Roberts 1996; Tanner and Kast 2003). Regarding the ecological dimension of sustainability, there are findings concerning the green consumer, the construct of green consumption, the willingness to pay more for environmentally friendly products, and the individuals' idealism to internalize some of the negative externalities from the production of the green goods they buy (Darnall et al. 2012; Eriksson 2008). Those consumers who are willing to pay more for environmentally friendly products are likely to be female, married, and to have at least one child living at home. They place high importance on security and warm relationships with others, and they often consider ecological issues when making a purchase (Laroche et al. 2001). Consumers are thus assumed to take an active part in solving environmental problems, e.g. by choosing environmentally-friendly products and living in ways that are environmentally conscious (Rokka and Uusitalo 2008). Regarding the social dimension of sustainability, research suggests a link between a company's social initiatives and positive consumer responses in attitudes, beliefs, and behaviours (Brown and Dacin 1997; Ellen et al. 2000; Handelmann and Arnold 1999). Examinations of the effects of

active engagement by consumers in social consumption finds positive associations between social initiatives and price, perceived quality, corporate attitudes, and purchase intentions (Briceno and Stagl 2006). However, research also suggests that consumers will punish firms that are perceived as insincere or manipulative in their social involvement (Becker-Olsen et al. 2006). Henion and Kinnear (1976) and Webster (1975) postulate that consumers concerned about sustainably possess certain psychological characteristics to a significantly higher degree than other consumers (e.g. they are more active and socially involved than the average consumer). In addition, the effects of values and beliefs on the importance of sustainable corporate performance and on the buying behaviour of customers are evaluated, e.g. by Collins et al. (2007).

The results of these studies uncover a multitude of factors that can influence customer behaviour in the context of sustainability. Most of the approaches (42 papers; (42%)) do not deal with a specific differentiation of customer behaviour but rather deal with the comprehensive construct. Our analysis shows that customers' perceptions (15; (15%)), the identification of sustainable customers (8; (8%)), customer satisfaction (5; (5%)), and customers' willingness to pay (4; (4%)), are also important topics of interest. 17 papers (17%) treat other minor topics and 10 (10%) papers cannot be clearly classified into one category. As presented above, we find that *a majority of the articles on the characteristics of sustainable consumers only focus on one of the dimensions of sustainability* (Finding F1).

II.2.3.2.2. Research approach

Most studies examining consumers' perceptions of socially and ecologically responsible behaviour are of an experimental nature (Singh et al. 2008). However, due to the complexity and multidimensional nature of both sustainability and customer projects, the results of these studies (e.g. Bhattacharya and Sen 2001; Brown and Dacin 1997; Handelmann and Arnold 1999; Mohr et al. 2001;) may not represent a real world context. For a comprehensive view on the topic of interest, we also examine conceptual approaches. Some conceptual research has already dealt with similar integrations and the resulting opportunities for research. Cronin et al. (2011) study the integration of marketing, management, and operations literature, and generate an investigative framework that identifies the various stakeholders potentially impacted by the environmental efforts of a firm. They propose a number of green marketing research opportunities and research questions by grouping the articles into three broad thematic categories (green performance, green strategy, and the green consumer) and relevant

sub-categories. Chabowski et al. (2011) indicate that the topics of citizenship, stakeholder theory, corporate performance, and the triple bottom line are integral sustainability research areas. In addition, their results identify five topics required for examining sustainability in marketing contexts: external-internal focus, social-environmental emphasis, legal-ethical-discretionary intent, marketing assets, and financial performance. Our study includes 59 (59%) papers on empirical research and 38 conceptual (38%) approaches. Three papers (3%) combine empirical and conceptual research and one paper (1%) cannot be classified into either of these categories.

II.2.3.2.3. Samples examined

Customer- and sustainability-related research is more prominent in some industries and geographic regions than in others. Based on the findings of Darnall et al. (2012), studies on consumer purchasing decisions are predominantly conducted in the area of organic certified products (Perrini et al. 2009), eco-labelled food (Loureiro et al. 2001), sustainable forest products (Teisl et al. 2002), and energy labelled electrical appliances (Sammer and Wüstenhagen 2006). As there are no agreed upon criteria for what constitutes a green product (Young et al. 2010), the term includes organic (Beckmann 2007) and fair trade products (Galarraga Gallastegui and Markandya 2000), as well as locally grown or produced, unpacked, seasonal, recycled, more durable, and energy efficient products (Darnall et al. 2012). The industries in our sample which focus on customer- and sustainability-related issues include the grocery industry (Anselmsson und Johannsen 2007; Ellen et al. 2000; Klein and Dawar 2004; Megicks et al. 2008), retail (Collins et al. 2007; Oppewal et al. 2006; Tanner and Kast 2003), energy technology (Kaenzig and Wüstenhangen 2008), and pharmaceutical and medical (Lindgreen et al. 2008; Vágási et al. 2003). In terms of geographic divisions, we find that the vast majority of the examined studies were conducted in Europe (31 papers; 31%), followed by the US (11; 11%). Only a few studies were conducted in the Asian Pacific region (8; 8%), South America (2; 2%), and Africa (1; 1%). Most of the conceptual papers (35 paper, 35%) do not look at specific samples and the remaining thirteen papers (13 paper, 13%) cannot be linked to a specific country as they treat e. g. a certain industry or cover a cross-national or even international perspective.

II.2.3.2.4. Chronological development of research

Since sustainable business policies and practices are likely to become increasingly important for the survival, growth, and profitability of businesses, many researchers have analysed the chronological development of sustainability-oriented customer research (Varadarajan 1992). Drucker (1974) was one of the first to observe the change from companies being expected to minimize societal and environmental impact to being expected to "produce a good society". The development of sustainable actions focused at customers can be categorized into three "ages" (Peattie 2001; Hult 2011). In the first age (1970s), ecological marketing was the predominant topic of research, focusing on particular environmental problems such as air pollution and the depletion of oil reserves (Henion and Kinnear 1976; Kassarjian 1971). In the same period, Kotler and Levy (1969) raised the idea of societal marketing, which states that organizations should "determine the wants, needs and interests of the customers by means that sustain or improve the welfare of consumers and society" (Krulis-Randa 1986, p. 13). In the second age (1980s), research shifted towards advocating clean technology, understanding and targeting the "green consumer", and achieving socio-environmental performance as potential competitive advantages (Elkington and Hailes 1988). Additionally, the raise of the concept of relationship marketing, which deals with relationships between businesses as coalitions of stakeholders and their customers, fell into this area (Murphy et al. 1997; Polonsky 1995). In the third age, sustainable marketing, which focuses on the goal of creating a sustainable economy, was the main topic. The broader emerging consumption concepts have in common that consumers consider not only individual but also common values, ideals, and ideologies (Uusitalo and Oksanen 2004). Generally, even though the development can be described clearly, there is no direct relationship between early (1950s–1980s) sustainability research and research conducted later (1990s and 2000s) (Chabowski et al. 2011; Roberts 1996). Research has found that *the behaviour of ecologically and socially conscious consumers has changed over time* (Finding F2)

II.2.4 Critical discussion

As the core criteria of analysis, we identified the main building blocks of sustainability-oriented CRM: the dimensions of sustainability and the operational CRM processes in the core areas of marketing, sales, and service. The second building block was chosen as these processes focus on managing contact with the customer for the length of the relationship. Our

detailed analysis of sustainability-oriented customer research shows that, within each of these core areas, the topic is treated differently.

II.2.4.1 Findings regarding CRM core area marketing

In general, the goal of marketing is increasing the number of interactions between potential customers and the organization. Marketing can therefore play an important role in developing the inter-functional coordination needed to meet the wants and needs in markets (Hurley and Hult 1998; Jaworski and Kohli 1993; Slater and Narver 2000) and can be the key link between organizations and markets. Furthermore, marketing can represent the main prerequisite in moving toward sustainability, as it is the organization's link to stakeholders and the key component in communicating sustainability efforts (Cronin et al. 2011). We find a dominance of marketing literature (Connelly et al. 2011) because consumption has long resided within the domain of marketing (Belk et al. 1996), and thus marketers have long been concerned about consumption related to sustainability (Crittenden et al. 2011).

The concept of sustainable marketing is defined as "marketing within, and supportive of, sustainable economic development" (van Dam and Apeldoorn 1996, p. 46) and hence focuses on the long-term preservation of companies. Depending on the focused dimension of sustainability, there is also green and societal marketing. Peattie (1995) defines green marketing as the holistic management process responsible for identifying, anticipating, and satisfying the requirements of customers and society, in a profitable and sustainable way. Social marketing focuses on the contribution of marketing activities to socially desirable behaviours and goals (Andreasen 1994). Kotler (2000), however, uses the term "societal marketing" to cover both social and ecological responsibilities. The implementation of sustainable marketing begins at the strategic level of a company, and Banerjee (1999) and Wehrmeyer (1999) thereby analyse the greening of strategic marketing with implications for marketing theory and practice. Pujari and Wright (1996) address the application of the strategy, structure, and process framework for organizational and product-level response to environmental imperatives. Menon and Menon (1997) emphasize the need for an entrepreneurial approach in bringing together ecological concerns and marketing strategy objectives. Piercy and Lane (2009) examine the ways in which socially-oriented activities are re-shaping the strategic marketing agenda, the ways in which companies are responding to social imperatives, and the impact of social responsibility on customer value. The ethical

perceptions, reasoning, and decision-making processes of marketing managers are further topics of research (Blodgett et al. 2001).

On an operational level, sustainability marketing research deals with a broad range of topics. Barone et al. (2000) find that cause-related marketing, environmentally friendly practices, and/or ethics are factors that lead to active consumer support for sustainability. Focusing on the social dimension, Peloza and Shang (2011) show the broad range of marketing research which addresses a variety of issues, e.g. the implementation of corporate social responsibility (CSR) measures (Maignan et al. 1999), increased loyalty (Du et al. 2007), customer satisfaction (McDonald and Rundle-Thiele 2008), willingness to pay premium prices (Creyer and Ross 1996), attitudes towards the corporation (Lichtenstein et al. 2004), and decreased attribution of blame in the face of a crisis (Klein and Dawar 2004). According to Maignan and Farrell (2004) marketing communication can enhance customers' affiliation with the firm based on a shared concern for a specific issue, and can stimulate customer interactions around CSR. With a focus on the ecological dimension, it is the aim of green marketing activities to investigate consumers' green attitudes and behaviours, to identify the market for green products, and to stratify the green market into different segments based on consumer needs (Chang and Fong 2010). Lee (2008) adds a global perspective by stating that corporations from developed countries will initiate international green marketing initiatives in order to expand their market, increase their sales, and take advantage of the positive image of green brands they have established in their domestic markets. In summary, even with the concept of sustainable marketing and researchers calling for the integration of all dimensions of sustainability into mainstream marketing concepts (McDonagh and Prothero 1997), *the majority of marketing research only focuses on either the social or the ecological dimension of sustainability* (Finding F3).

II.2.4.2 Findings regarding CRM core area sales

Sales can be viewed as the completion of a commercial activity. Sales activities include acquiring new customers, introducing new products, increasing the share of wallet, and cross selling (Gründling 2009) and hence may be difficult to distinguish from marketing activities. Here, we consider all activities primarily aimed at increasing corporate sales. Research regarding the enabling factors for sustainable sales processes concludes that an effective and efficient sales force contributes significantly to the success of sales activities. It is therefore

important that sales staff act sustainably by, for example, devoting time to customers, using sustainable channels, and acting credibly (Ruhwinkel 2013).

Furthermore, research analysing the success of sales activities finds that substantial increases in sales could be achieved by certifying their products as sustainable (Harris 2007). Additionally, the brand of a product combined with its physical characteristics influence consumer choice (Megicks et al. 2008). This is in line with the findings of others (e.g. Darnall et al. 2012; Young et al. 2010) who research the factors that encourage potential eco-label users to buy green. Eco-labels are defined as product seals that convey information about a product's single environmental attribute, for which the product either qualifies or not (Darnall et al. 2012). They claim that due to the multitude of environmental certifications present in the market, which is very confusing to consumers, there is need for credible eco-labels whereby customers can easily identify genuinely sustainable products (Harris 2007). Darnall et al. (2012) analyse the properties of those customers who are more likely to buy eco-labelled products and find that they either understand more about climate change, feel more empowered to address these issues related to climate change, or trust government and environmental groups to provide information about climate change.

Nonetheless, sustainability initiatives will not be pursued and sales will not be realised unless customers reward a company's sustainability practices through their purchase decisions (Arrendondo-Tapero et al. 2010). The rationale for this idea is that when customers observe a firm's socially or ecologically responsible behaviour, they will consider that firm a preferred party for transactions. Since consumers' purchases make them the final judges of a corporation's behaviour, it is important to understand the internal characteristics that influence buying behaviour and how they are related to the features of the product or service. According to the framework depicted by Bhattacharya and Sen (2004), there are two key moderators of the response of consumers to sustainability: individual consumer-specific factors (such as support for sustainability issues, or demand for given product social attributes) and company-specific factors (such as the specific sustainability issues a company focuses on). Consumers' behaviour toward a company (e.g. purchasing or boycotting its products) therefore depends on how they view the company (Klein and Dawar 2004), which, in turn, influences their willingness to pay a premium price (Auger et al. 2003; Castaldo et al. 2009). On the revenue side, this means that sustainably responsible firms should be able to attract and retain customers and be able to charge premium prices for their products (Barnett

2007; Castaldo et al. 2009). In addition, Beckmann's (2007) summary of research on consumer perception and response towards CSR suggests that there are positive relationships between a company's CSR activity and consumers' reactions to that company and its products. Bhattacharya and Sen (2001) support the suggestion that a company's efforts in CSR have direct effects on the attractiveness of the company's products, in addition to a positive effect on company evaluations by customers (McDonald et al. 2009; McDonald and Rundle-Thiele 2008).

Many firms believe that "green and good would sell" but not all of them are willing to incorporate sustainability holistically and thoroughly into their operations. However, this would be required for sales to fulfil its function to convert customers from merely being interested in a company's products to embarking on a loyal and long-lasting relationship. There remains a substantial risk that some corporations only claim to be acting sustainably by adjusting their promotional campaigns and do not actually adjust their operations to adopt sustainable processes. This can lead to what Peattie and Crane (2005) refer to as a "green selling" approach, i.e. a post-hoc identification of environmental features in existing products, thus "prompting a (usually short-term) hop onto the green bandwagon" (p. 361). Research shows that even though research deals with sustainable sales processes within the core area of sales, *the risk remains that the belief that "green and good would sell" could lead to unsustainable practices* (Finding F4).

II.2.4.3 Findings regarding CRM core area services

"Customer service is a series of activities designed to enhance the level of customer satisfaction – that is, the feeling that a product or service has met customer expectation" (Turban 2002). Service processes include feedback, support, and after-sales. Thus, not only product- or service-related information but also information regarding the operations of a company is transmitted to the customer. Customer service – in combination with product quality and promotion – is therefore one of the most important motivators of consumers when they are looking for ethical and socially responsible solutions (Megicks et al. 2008). Another factor influencing customer decision-making in service contexts is that, in contrast to the measureable and certifiable ecological attributes, the ethical attributes of a product are often a credence attribute (De Pelsmacker et al. 2005). Therefore, customers cannot judge the ethical attributes before, during, or after product use (Valor 2008), as they become part of the augmented product (Crane 2001; McGoldrick and Freestone 2008). Services can

counterbalance this intangibility and provide the series of accompanying activities required. From the supplier's perspective, companies can improve their current level of sustainability and profitability by focusing on services that extend the efficiency and value of their products (Rothenberg 2007). To make services value-generating and fulfilling of customers' demands (Bansal 2005), the staff involved in the sales process should be trained and motivated to treat every costumer equally and fairly (De la Cuesta and Valor 2003).

Wong et al. (2013) developed a model linking two key green service practices – green service delivery and green service support – and show that this construct can contribute to cost reduction and improve company's performance on environmental factors. The model is grounded in both the natural resource-based view and contingency theory and considers the moderating role of the existing environmental management systems that may affect the performance of green service practices. Of further importance in this context are product services models, which represent a mix of tangible products and intangible services, so that they are jointly capable of fulfilling customer needs (Tukker et al. 2009). Green product services models are those that are innovative and emergent in adding value in improved sustainability or environmental performance over business as usual. Finally, there are only a few approaches focusing on the core area of services. *Existing sustainable service practices aim to provide value to customers throughout their life-cycle.* (Finding F5)

II.2.4.4 Overarching findings

When focusing on the core areas of CRM, as suggested by Connelly et al. (2011), we find a dominance of marketing literature. A total of 41 approaches (41%) focus on this core area, while only 22 approaches (22%) address the core area of sales, and three papers (3%) deal with the core area of services. Seven approaches (7%) deal with a combination of marketing and sales aspects and for 20 papers (20%) a clear focus cannot be identified. Only eight approaches (8%) deal with all core areas. Hence, within current research, the idea of the comprehensive companionship of the customer is rarely present, as *only a few papers are based on an approach that considers two or all three core areas of CRM.* (Finding F6)

Furthermore, all approaches treat one or more dimensions of sustainability. The dimensions are predominantly treated separately, with 38 approaches (38%) focusing only on the ecological dimension and 39 papers (39%) solely concentrating on the social dimension. While four approaches (4%) deal with the social and ecological dimensions concurrently, only

one paper (1%) deals simultaneously with the ecological and economic dimensions. Only a few papers (19; (19%)) are based on a comprehensive approach that considers all three dimensions. This could be because companies see greater potential in either social or ecological actions that eventually lead to economic improvement than in purely economic-orientated actions, which result in more references related to the social and ecological dimensions for researchers to examine and analyse. Hence, it appears that within sustainability-oriented customer research *there is only an "either-or", i.e. a focus on either the social or the ecological dimension of sustainability.* (Finding F7)

Even though there is a common understanding in literature and practice that behind the drive for sustainability lies a growing belief that environmental and social projects foster innovation, cut costs, and open up new markets (Skapinker 2008), there are only a few articles (20, (20 %)) that consider the economic dimension of sustainability. Even more rarely there are papers that deal with the ecological and economic dimension simultaneously (1; (1%)) and that treat the social and economic dimension at the same time (0; (0%)). *There are only a few articles that consider the economic dimension of sustainability.* (Finding F8)

Only a few authors take on the challenge of dealing with all dimensions of sustainability and all areas of CRM in one approach and name their papers accordingly. Ruhwinkel and Wilde (2011), for example, developed an interdisciplinary research concept that describes the current state of the art in research on sustainability (marketing), its development, and possible linkages to the wider fields of CRM and stakeholder management. In contrast, Vágási et al. (2003) evaluate sustainability issues related to the customer relationship. Referring to macroeconomic requirements and management application of the sustainability theory, they analyse its integration into marketing concepts. Additionally, in their paper, "Sustainable CRM for Mobility Services based on SOA architecture", Wagner vom Berg et al. (2011) present a technological as well as a business model for approaching the problems of multi-modal transportation planning and sustainable mobility with a customer focus.

Despite the broad range of topics covered, current research rarely pursues the integrated perspective (with respect to the individual topics of analysis CRM and sustainability). To fully exploit the potential of the comprehensive research field of sustainability-oriented CRM, there is a need for further research.

II.2.5 Identified opportunities for future research

Integrating the economic, ecological, and social sustainability issues and the core areas of CRM (marketing, sales, and service) is complex, and adopting sustainability-oriented CRM practices therefore presents unique challenges. To analyse how to achieve progress in theory and practice, we can draw from the aforementioned findings of sustainability-oriented customer-research. The literature review identified research gaps that should be addressed in future research (Webster and Watson 2002). Tab. II-7 provides a list of these research opportunities, each of which is described in detail.

Tab. II-7 Findings and research opportunities

Finding	Research opportunity
F1: A majority of the articles on the characteristics of sustainable consumers only focus on one of the dimensions of sustainability. F3: The majority of marketing research only focuses on either the social or the ecological dimension of sustainability. F7: Within sustainability-oriented customer research there is only an "either-or", i.e. a focus on either the social or the ecological dimension of sustainability.	RO1: Examine the interconnectedness of the three dimensions of sustainability in customer-related contexts.
F8: There are only a few articles that consider the economic dimension of sustainability.	RO2: Examine customer-oriented sustainability metrics based on customer metrics.
F4: Within the core area of sales, the risk remains that the belief that "green and good would sell" could lead to unsustainable practices.	RO3: Investigate the credibility and consistency of sustainability initiatives throughout the company.
F2: Research shares the finding that the behaviour of the ecologically and socially conscious consumers has changed over time. F5: Existing sustainable service practices aim to provide value to customers throughout their life-cycle. F6: Within current research, the idea of the comprehensive companionship of the customer is rarely present, as only a few papers are based on an approach that considers two or all three core areas of CRM.	RO4: Understand the effects of sustainability-oriented CRM initiatives throughout the entire customer relationship.

Research opportunity RO1: Examine the interconnectedness of the three dimensions of sustainability in customer-related contexts. Our research supports the finding of other approaches that there is a tendency to treat the dimensions of sustainability separately. We find this within the overall research area of sustainability-oriented CRM (F7) but it is also apparent when we look at research focusing on the characteristics of sustainable consumers (F1) and on marketing (F3). However, as "being sustainable" includes all three dimensions, future research should aim at the integration of the dimensions. Most of the current research suggests distinguishing between social, ecological, or economic sustainability issues (Chabowski et al. 2011). But in fact, most sustainability actions can be seen as socially as well as environmentally based constructs; e.g. CSR can be understood as an environmental or social responsibility (Ellen et al. 2006; Matten and Moon 2008). Hence, in corporate decision-making and especially in customer-related contexts, the interconnectedness of the dimensions must be considered. Addressing more than one dimension of sustainability can inevitably lead to conflicts, as targets in one dimension are not necessarily targets in one or all of the other dimensions, and as there are synergetic and rival dependencies between the dimensions. A comprehensive view – bringing the dimensions of sustainability together and viewing them as an integrated construct and thereby not emphasizing the origin of sustainability actions – is hence of importance in customer contexts.

Research opportunity RO2: Examine customer-oriented sustainability metrics based on customer metrics. The economic contribution and the business case are the main decision criteria for any sustainability action and today, at the business level, sustainability is mainly equated with economic or financial sustainability (Dyllick and Hockerts 2002). Even though it does not appear frequently in the analysed literature (F8), the economic perspective has emerged as an additional organizational incentive to engage in sustainability transformations (Seidel et al 2010). There are approaches in theory and practice that support decision making in this context, e.g. the composite sustainable development index that depicts the performance of companies along all three dimensions of sustainability (Krajnc and Glavic 2005). The findings of value-oriented CRM, which postulate that all CRM activities and decisions have to be consistently linked to the goal of maximizing long-term shareholder value (Rao and Bharadwaj 2008), can contribute reasonably to examining the research areas of sustainability-oriented CRM. Hence, the popular and widely applied customer metrics (e.g. customer lifetime value, customer equity (Berger and Nasr 1998) or Customer Equity Sustainability

Ratio (Skiera et al. 2011)) could serve as the basis for determining customer-oriented sustainability metrics which support decision-making in this context.

Research opportunity RO3: Investigate the credibility and consistency of sustainability initiatives throughout the company. Sustainability needs to be reflected throughout the company so that the actions of any part of the company are consistent with the general sustainability policy, and they need to affect all internal business practices (Seidel et al. 2010). Furthermore, sustainability actions should be chosen carefully to reflect the firm's values and domain, which would allow customers to perceive it as socially and environmentally motivated (Becker-Olsen et al. 2006). Some producers have developed a number of strategies to address these concerns and to take advantage of them by publicising the "clean green", "eco", "organic", or "natural" status of their products, even though this may not be true (F4). Marketing and sales approaches vary from the promotion of independently certified products to "green labelling" of products using "green" colour schemes and "green imaging". Furthermore, sustainability goals strongly influence component selection, materials sourcing, production, packaging, distribution, and recycling decisions (Closs et al. 2011). However, such claims and marketing approaches do not necessarily mean that products are sustainably produced (Harris 2007). Keeping in mind that awareness of unethical and un-environmental policies and activities could lead to consumers boycotting brands (Anselmsson and Johannsen 2007), credibility with customers and other stakeholders is critical to corporate success. Thus, fostering changes in production, trade practices, or consumption are crucial steps in the quest for sustainable development (Tanner and Kast 2003). In order to achieve credibility and consistency, organizations are faced with the challenge of developing internal and external sustainability strategies (Cronin et al. 2011; Kleindorfer et al. 2005). Internal efforts are aimed at e.g. recovering pollution causing outputs, developing substitutes for non-renewable inputs, and redesigning products to reduce material content and energy consumption. Similarly, external strategies are likely to focus on e.g. developing core competences in products, processes, and other life-cycle activities that emphasize long-term sustainability. This is important, as a company interested in establishing its social and environmental legitimacy must respect its own internal goods (Arrendondo-Tapero et al. 2010). These considerations can even be extended to the entire supply chain, as customers and other external stakeholders may not distinguish between the actions of the brand owner and its supply chain partners (Roberts 2003).

Research opportunity RO4: Understand the effects of sustainability-oriented CRM initiatives throughout the entire customer relationship. It is the basic idea of CRM to accompany customers throughout the different phases of the customer life-cycle (acquisition, introduction to products, profiling of customers, growth of customer base, cultivation of loyalty among customers, and termination of customer relationship). As the sustainably conscious customer represents a newly emerging type of customer (F2), the acquisition, retention, development of loyalty, and prevention of termination of this customer group which can act as a role model in educating society towards a better future is of strategic importance. Companies increasingly need to respond to the changing needs of these customers in order to survive in the market. In research to date, there are only first approaches based on the idea of the comprehensive companionship throughout the life-cycle of the sustainable customer (F5, F6). For implementation, it should be considered that customers may respond to sustainability with an array of behaviours (Sen et al. 2006). Responses to even a single initiative vary from person to person because individuals develop different assessments of such initiatives (Bhattachary et al. 2009; Bhattacharya and Sen 2004). Previous sustainability-oriented customer research has often focused on the role of individual factors, such as knowledge, societal concern, attitudes, norms, and values (e.g. Becker-Olsen et al. 2006; Collins et al. 2007; Klein and Dawar 2004; Lichtenstein et al. 2004). In accordance with stakeholder theory, it might be helpful to view the customer also as a citizen, a parent, an employee, a community member, or a member of a global village with a long-term stake in the future of the planet (Smith et al. 2010). By doing so, companies will take into consideration the various needs of individual customers.

The research opportunities presented show that, even though research has already dealt with a multitude of customer- and sustainability-related issues, an integrated perspective considering the interconnectedness of dimensions of sustainability and the effects of sustainability-oriented CRM initiatives throughout the entire customer relationship is missing.

II.2.6 Conclusions and limitations

Corporations worldwide are being challenged to create new, environmentally sustainable, and socially responsive organizations, while enhancing company value and remaining customer-oriented (Closs et al. 2011). The question of identifying, gaining, and keeping those customers who are willing to pay more for environmentally and socially friendly products has been analysed in different research approaches over the last years. Although the comprehensive

concept of sustainability-oriented CRM bears great potential for economic, ecological, and social improvement, little research in that field exists. With the goal of describing the development and current state of sustainability-oriented CRM, this paper takes into account the core areas of CRM and the dimensions of sustainability. Furthermore, this approach highlights a number of future research opportunities deriving from the integration of sustainability- and customer-related research. In this context, we focus on identifying relevant publications by means of a literature search.

The first research objective addresses the question of how findings from existing research can contribute to the understanding of sustainability-oriented CRM research. In literature, not only the core areas of CRM (marketing, sales, and services) but also the three dimensions of sustainability (ecological, social, and economic) are rarely treated as comprehensive constructs. Current research treats them separately, and only a few papers are based on a comprehensive triple bottom line or CRM concept, which considers all three dimensions or all core areas and which is required to thoroughly analyse the examined construct. Furthermore, we find a prevalence of marketing literature and a focus on the environmental dimension of sustainability. This could be partially explained by the development of sustainability-oriented customer research that has one of its origins in the field of green marketing. To analyse what enables and empowers sustainability-oriented CRM initiatives and how these can be further advanced and improved, future research opportunities were presented (research question 2). Challenges regarding the management of sustainability- and customer-related topics remain and will need to be addressed as the development of sustainability-oriented CRM continues and research progresses in the coming years. It is our hope that these research results can stimulate and guide future research in this field.

Besides the previously highlighted benefits, this paper offers opportunities for discussion and identifies limitations. First, although we conducted a broad literature search, it is likely that not all relevant articles have been identified, as customer- and sustainability are both multifaceted constructs. Also, the keywords used may not have been a complete list of possible search terms emphasizing sustainability topics. Even though many topics in a sustainability-related customer context provide the basis for our analysis (Hult and Chabowski 2008), there may be other search terms which could identify additional relevant articles. Second, literature was only analysed with regard to the core areas of CRM and the dimensions of sustainability. Thus, our perspective is focused and excludes other approaches to CRM

(e.g. functions of CRM or phases of the customer life-cycle). Further research could extend the current body of research by considering other aspects (e.g. customer valuation methods or decision principles in the context of sustainable customers). Furthermore, in the customer context, we focus on humans and their behaviour as the primary body of analysis. Hence, the following challenge remains: Recent changes in the mind-set of customers towards sustainable consumption can be seen, but such shifts in attitude are difficult to track. While 87% of consumers worry about the environmental and social impacts of their purchases, only 33% buy green products (Bonini and Oppenheim 2008). Hence, green products account for less than 4% of the global product market share (UNEP 2005). Furthermore, only 27% of those who claim to prefer organic production methods actually buy organic (Bellows et al. 2008). There is, therefore, an attitude–behaviour gap (Fisher 1993) and a gap between the professed beliefs of consumers and their actual behaviours (Pickett-Baker and Ozaki 2008).

Despite the limitations outlined above, our approach delivers insights into the assessment of sustainability and may serve as a first step towards integrating sustainability and CRM. We hope that it helps to provide a preliminary overview and a better understanding of the body of knowledge regarding sustainability-oriented CRM.

II.2.7 Appendix

Tab. II-8 Overview of studies examined (Studies are assorted alphabetically by author)

Content		Description			Context-Related	
References	**Findings**	**Customer Behaviour Analysed**	**Research Approach**	**Sample Examined**	**Focused Dimension (s) of Sust-ainability**	**Focused Core Area(s) of CRM**
Anderson and Cunningham (1972)	The socio-psychological variables appear to be more effective in differentiating between the high and low socially responsible consumers than were the demographic variables.	Identification of sustainable customers	Empirical	US; 412 questionnaires in Austin metropolitan area	Social	Overall
Anselmsson and Johansson (2007)	Examine the significance consumers place on different aspects of CSR when evaluating and purchasing grocery brands and products.	Customers' perceptions	Empirical	SWE; 200 interviews (66 in Helsingborg, 70 in Lund, 64 in Malmö)	Social	Marketing/ Sales
Arli and Lasmono (2010)	When consumers have to buy similar products with the same price and quality, CSR could be the determining factor as they would buy from the firm that has a socially responsible reputation.	Customers' perceptions	Empirical	ID; 443 undergraduate students	Social	Marketing/ Sales
Arredondo Trapero et al. (2010)	Products made with CSR haven't achieved much influence in the buying decision making or in the need of being informed about the CSR practices.	Buying decision making	Empirical	MX; 189 undergraduate students	Social	Sales
Auger et al. (2003)	Consumers have a general and fairly rational view of ethical issues as they pertain to product purchases; most consumers seem quite ignorant of the ethical features that comprise the products they consider and purchase.	Relative value consumers place on the social features of products	Empirical	AU and HK; students and supporters of Amnesty International	Social	Sales
Auger et al. (2008)	The social features of products can affect an individuals' likelihood of purchasing a product. There are distinctive segments of ethically orientated consumers.	Relative value consumers place on the social features of products	Empirical	AU and HK; students and supporters of Amnesty International	Social	Sales
Baker and Sikula (2005)	Environmental marketing directly influence firms' capabilities (e. g., new product development success) but not their competitive advantage (e. g., change in market share).	-	Conceptual/ Empirical	2,000 top marketing executives in manufacturing and service organizations	Ecological	Marketing
Balderjahn (1988)	The ecologically concerned consumer belongs to the upper social classes.	Identification of sustainable customers	Conceptual	-	Ecological	-

Content		Description			Context-Related	
References	**Findings**	**Customer Behaviour Analysed**	**Research Approach**	**Sample Examined**	**Focused Dimension (s) of Sust-ainability**	**Focused Core Area(s) of CRM**
Bamberg and Möser (2006)	Pro-environmental behavioural intention mediate the impact of all other psycho-social variables.	Identification of sustainable customers	Conceptual	-	Ecological	-
Beckler-Olsen et al. (2006)	Low-fit initiatives negatively impact consumer beliefs, attitudes, and intentions no matter what the firm's motivation; high-fit initiatives that are profit-motivated have the same impact.	Customers' perceptions	Conceptual	-	Social	Sales
Beckmann (2007)	There is a serious lack of knowledge concerning the consequences of strategic CSR activities.	General customer behaviour	Conceptual	-	Social	Marketing
Bhattachary a and Sen (2001)	Examine when, how, and for whom specific CSR initiatives work.	Customers' perceptions	Conceptual	-	Social	Marketing/ Sales
Bhattachary a and Sen (2004)	By understanding consumer reactions to CSR, firms can develop CSR strategies that are optimal from not only a normative perspective, but also a business one.	General customer behaviour	Conceptual	-	Social	Marketing/ Sales
Bhattachary a et al. (2009)	The quality of the stakeholder-company relationship resulting from a CSR initiative depends on the type of benefits stakeholders obtain from it.	Customers' perceptions	Conceptual	-	Social	Marketing
Bohlen et al. (1993)	Examine customer perceptions of environmental nuisances.	Customers' perceptions	Empirical	UK; 34 members of the general public	Ecological	Marketing
Buysse and Verbeke (2003)	More proactive environmental strategies are associated with a deeper and broader coverage of stakeholders.	Customers' perceptions	Empirical	BE; 197 firms	Ecological	-
Carter and Carter (1998)	Environmental purchasing activities will be facilitated through increased coordination with suppliers as well as downstream members of the supply chain, including retailers.	General customer behaviour	Empirical	-	Ecological	Sales
Castaldo et al. (2009)	Socially-oriented companies can successfully leverage their reputation to market products with high symbolic values.	Customers' perceptions	Empirical	IT; clients of retail chains offering Fair Trade products in Milan and Florence	Social	Marketing
Cembalo et al. (2011)	One of the main characteristics of a solidarity purchasing group is the direct relationships between small farms and their customers; a relationship that is	Satisfaction	Empirical	IT; Solidarity Purchasing Groups in	Social/ Ecological/ Economic	Sales

Content		Description			Context-Related	
References	**Findings**	**Customer Behaviour Analysed**	**Research Approach**	**Sample Examined**	**Focused Dimension (s) of Sust-ainability**	**Focused Core Area(s) of CRM**
	characterized by consumer participation and farmer specialization.			Sicily		
Chabowski et al. (2011)	There are five required topics for examining sustainability in the marketing context: external-internal focus, social-environmental emphasis, legal-ethical-discretionary intent, marketing assets, and financial performance.	-	Conceptual	sustainability research in marketing 1958–2008 (76,342 citations made in 1,320 sustainability-focused articles from 36 journals)	Social/ Ecological/ Economic	Marketing
Chang and Fong (2010)	Green product quality could bring about green customer satisfaction and green customer loyalty. Also green corporate image contributes to green customer satisfaction and green customer loyalty.	Satisfaction, Customers' perceptions	Empirical	TW; 196 participations randomly selected from the "Taiwan Yellow Pages"	Ecological	Overall
Chen (2010)	Green brand image, green satisfaction, and green trust are positively related to green brand equity.	Customers' perceptions	Empirical	Purchases of information and electronics products	Ecological	Marketing
Chitra (2007)	Customer can be categorized based on their level of eco-friendliness.	Awareness, preference, Satisfaction	Empirical	-	Ecological	Marketing
Choi and Ng (2011)	Find that consumers respond to multiple dimensions of sustainability.	Consumer responses	Empirical	-	Ecological/ Economic	Overall
Collins et al. (2007)	Beliefs about the importance of sustainable corporate performance SCP (both social and environmental, but not economic) were found to be related to values; customers' environmentally responsible buying behaviours were related to their beliefs about the importance of environmental SCP; socially responsible buying was not related to their beliefs about the importance of social SCP.	General customer behaviour, values and beliefs	Empirical	NL; 209 customers from Aldi and Albert Heijn supermarkets in Groningen	Social/ Ecological/ Economic	Overall
Connelly et al. (2011)	This paper provides a foundation for future marketing research on sustainability through the application of nine prominent organizational theories.	-	Conceptual	-	Social/ Ecological/ Economic	Marketing
Crittenden et al. (2011)	While the triumvirate of environmental integrity, social equity, and economic prosperity surrounds the actions of market-	-	Conceptual	-	Social/ Ecological/	Marketing

Content		Description			Context-Related	
References	**Findings**	**Customer Behaviour Analysed**	**Research Approach**	**Sample Examined**	**Focused Dimension (s) of Sust-ainability**	**Focused Core Area(s) of CRM**
	oriented sustainability, they are not the inherent drivers of sustainability.				Economic	
Cronin et al. (2011)	The number of firms enacting socially responsible strategies to increase their triple-bottom line performance will continue to rise.	-	Conceptual	-	Social/ Ecological/ Economic	Marketing
Darnall et al. (2012)	Individuals who either a) understand more about climate change issues, b) feel more empowered to address these issues or c) trust government and environmental groups to provide information about climate change; are more likely to engage in green consumption and use environmental labels.	General customer behaviour	Empirical	UK; 1513 British customers	Ecological	Sales
Daub and Ergenzinger (2005)	Providing an impression of all possible needs, wants, and expectations a company can expect from its customers alters marketing's view of the customer and brings about a new understanding of customer satisfaction.	Satisfaction	Conceptual	-	Social/ Ecological/ Economic	-
de los Salmones et al. (2005)	A company with well-defined ethical codes and a clear philosophy of social commitment, respect for the environment and honesty in its relationships with the stakeholders, will be able to achieve better economic results.	General customer behaviour	Empirical	ES; 689 mobile telephone users	Social	-
Dean (2003)	A firm enhances its image by pursuing an unconditional donation, but a conditional donation did not damage firm image.	General customer behaviour	Empirical	Students enrolled in undergraduate marketing courses	Social	-
Diamantopoulos et al. (2003)	It seems prudent for companies to position their products not only according to environmental aspects, but also on the basis of other important product characteristics, where a combination of psychographic and socio-demographic variables can be applied more readily.	General customer behaviour	Conceptual/ Empirical	UK; large nationwide sample of British consumers	Ecological	-
Ellen et al. (2000)	Respondent evaluations were more positive for disaster-related as compared to ongoing causes, and for donations involving greater effort (i. e., product rather than cash contributions). There were no differences in evaluations related to the firm's degree of commitment.	Consumer response to cause marketing	Empirical	US; grocery and building supply stores	Social	Sales
Ellen et al. (2006)	Consumers respond most positively to CSR efforts they judge as values driven and strategic while responding negatively to	Consumers' attributions	Empirical	US; 281 students at a major	Social	Marketing

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References	**Findings**	**Customer Behaviour Analysed**	**Research Approach**	**Sample Examined**	**Focused Dimension (s) of Sust-ainability**	**Focused Core Area(s) of CRM**
	efforts they perceive as stakeholder driven or egoistic.			university		
Eriksson (2008)	Examines impact of idealistic behaviour on the market equilibrium, and to what extent it can replace the environmental regulation.	Consumer's willingness to pay	Conceptual	-	Ecological	-
Faiers et al. (2007)	Improved understanding of consumer behaviour, product attributes and socio-environmental theories that relate to energy use.	General customer behaviour	Conceptual	UK; Domestic energy use	Ecological	-
Gatersleben et al. (2002)	Respondents who indicate they behave more pro-environmentally do not necessarily use less energy; pro-environmental behaviour is more strongly related to attitudinal variables, whereas household energy use is primarily related to variables such as income and household size.	General customer behaviour	Empirical	NE; Dutch households	Ecological	-
Handelman and Arnold (1999)	There is a minimum acceptable level of marketing actions within the social dimension, below which the effectiveness of a firm's economic oriented actions is hindered significantly.	-	Empirical	Retail context	Social	Marketing
Harris (2007)	There is consumer demand for products that are clearly identified as genuinely sustainable, even though they may be perceived to be more expensive than traditional products. Consumers' concern regarding sustainability increases, and product disclosure standards become more stringent.	General customer behaviour	Empirical	AUS; NZ; First-ever fast moving consumer goods independently certified as sustainable	Social/ Ecological/ Economic	Sales
Hult (2011)	Market-based sustainability is achieved to the extent that a firm strategically aligns itself with the market-oriented product needs and wants of customers and the interests of multiple stakeholders concerned about social responsibility issues.	-	Conceptual	-	Social/ Ecological/ Economic	Marketing
Jackson (2005)	Examines whether, or to what extent, consumption can be taken as ''good for us.''	General customer behaviour	Conceptual	-	Social	-
Kaenzig and Wüstenhagen (2008)	Provides critical insights for successful creation of customer value with new residential energy technologies.	General customer behaviour	Empirical	CH; 9 focus groups with 61 participants and 15 individual interviews	Ecological	-

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References	**Findings**	**Customer Behaviour Analysed**	**Research Approach**	**Sample Examined**	**Focused Dimension (s) of Sust-ainability**	**Focused Core Area(s) of CRM**
Kärnä et al. (2003)	Green values, environmental marketing strategies, structures and functions are logically connected to each other.	-	-	FIN, GER and UK	Social/ Ecological	Marketing
Kassarjian (1971)	Consumers are willing to try the product at premium prices.	Product and brand awareness	Empirical	US; gasoline customer of Santa Monica	Ecological	Marketing
Kinnear et al. (1974)	Social influence is the top predictor of green purchasing behaviour.	General customer behaviour	Empirical	CAN; 500 members of the Canadian Family Opinion Panel.	Ecological	Marketing
Klein and Dawar (2004)	The role of CSR in consumer behaviour is more complex than previously conceptualized.	Consumers' brand and product evaluations	Empirical	Oil company	Social	Marketing/ Sales
Laroche et al. (2001)	Identification of profiles of consumers who are willing to pay more for environmentally friendly products: females, married and with at least one child living at home.	Identification of sustainable customers	Conceptual	US; 22 census tracts in 17 municipalities	Ecological	Sales
Lee (2008)	Social influence is the top predictor of Hong Kong adolescents' green purchasing behaviour.	General customer behaviour	Empirical	HK; 6,010 adolescents	Ecological	Marketing
Lichtenstein et al. (2004)	A corporation's socially responsible behaviour can positively affect consumers' attitudes toward the corporation. The effect occurs both directly and indirectly through the behaviour's effect on customer-corporation identification.	Consumer donations	Empirical	US; 1000 customer at four locations of a national food chain	Social	-
Lindgreen et al. (2008)	Environmental and social sustainability dimensions are personally relevant but professionally secondary to cost and performance. Incorporating a product's environmental and social credentials within the marketing enhances the perception of the product offering in decision-making stakeholders' minds and provides a means of differentiation.	General customer behaviour	Empirical	NE; seven hospitals and one private imaging centre; 22 interviews with key decision-making stakeholders	Social/ Ecological	Marketing
Maciag and Hepting (2008)	Support tools that enable consumers to obtain higher decision accuracies could provide consumers with a more satisfying shopping experience and possibly increase the selection of eco-friendly alternatives.	General customer behaviour	Empirical	GR; Greek consumers	Ecological	Sales

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Maignan and Ferrell (2004)	Marketers can contribute to the successful management of CSR by expanding their focus beyond consumers to include other stakeholders and by bundling together various social responsibility initiatives.	-	Conceptual	-	Social	Marketing
McDonald and Oates (2006)	Activities are perceived so differently by individuals that it is difficult to implement a general marketing strategy to encourage such activities.	General customer behaviour	Empirical	UK; 40 sustainability activities with 78 consumers	Social/ Ecological/ Economic	Marketing
McDonald and Rundle-Thiele (2008)	It is important to understand the likely impact on customer satisfaction of CSR initiatives vis-à-vis customer-centric initiatives	Satisfaction	Conceptual	-	Social	Marketing
McDonald et al. (2009)	Green consumer will not use the same information sources or decision-making criteria, consider the same options or focus on the same industry actors, for products in different sectors.	Consumption	Empirical	UK; 99 interviews with green consumers	Social/ Ecological/ Economic	-
McGoldrick and Freestone (2008)	Demographics proved to be poor predictors, although education explained some variance in willingness to pay.	Willingness to pay	Empirical	UK; mail survey of 1000 consumers	Social	Sales
Megicks et al. (2008)	The provision of ethically farmed products has most influence on store choice when "main" shopping, while retailers' fair trading and environmentally responsible policies have the greatest influence when "topping-up".	Product Choice	Empirical	AU: Australian grocery products and stores	Social	Services
Menon and Menon (1997)	Development of a model of the antecedents and consequences of an enviropreneurial marketing strategy.	General customer behaviour	Conceptual	interviews with managers, portfolio managers for socially responsible funds, and environmenta l journalist	Ecological	Marketing
Mostafa (2007)	Women appeared to be less aware of environmental issues compared with men. Men showed more environmental concern and more positive outlook towards green purchase compared with women.	Identification of sustainable customers	Empirical	EG: 1093 respondents	Ecological	Sales
Noblet et al. (2006)	Environmental attributes of an eco-labelled passenger vehicle are significant in the purchase decision.	General customer behaviour	Conceptual/ Empirical	US; Maine registered vehicle owners	Ecological	Sales

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Oates et al. (2008)	The role of information seeking was present to some extent for all consumers but the sources consulted, trusted and used were diverse.	General customer behaviour	Conceptual	-	Social/ Ecological/ Economic	Marketing/ Sales
Obermiller et al. (2009)	Examines consumers' coffee preferences, their comprehension of labels, and the price they are willing to pay and tests the effectiveness of advertising socially responsible consumption as primary benefit.	Identification of sustainable customers	Conceptual	-	Social	Marketing
Oppewal et al. (2006)	Explanatory and predictive performance of destination choice models for shopping can improve if they include indicators of a centre's CSR performance but the effects of CSR attributes are small compared to the effects of non-CSR attributes.	Customers' perceptions	Empirical	UK; two conjoint experiments conducted on shoppers	Social	-
Osterhus (1997)	Consumer trust in the marketing source and attributions of consumer responsibility must be activated for pro-social positioning strategies to work.	General customer behaviour	Conceptual	-	Social	Marketing
Page and Fearn (2005)	Poor corporate reputation makes building strong brands difficult, but a good reputation is no guarantee of success.	Customers' perceptions	Empirical	UK/US/JP; interviews with 22,000 consumers on their opinions of 111 key corporations	Social/ Ecological/ Economic	Marketing
Peak and Nelson (2009)	Altruism and beliefs in advertising ethics are significantly related to participants' responses to cause-related advertising, whereas advertising ethics appear more strongly related to boycotting advertising effects.	Socially responsible consumer behaviour	Empirical	US; national survey data	Social	Marketing
Peattie (2001)	There is an evolution from ecological to environmental and to sustainability marketing.	General customer behaviour	Conceptual	-	Ecological	Marketing
Peattie and Crane (2005)	Examines how the marketing discipline may contribute to progress towards greater sustainability.	General customer behaviour	Conceptual	-	Ecological	Marketing
Pedersen and Neergaard (2006)	Concept of the 'green' consumer is over-simplified and fails to capture the actual complexity of consumer values, attitudes and behaviour.	General customer behaviour	Conceptual	-	Ecological	-

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Peloza and Shang (2011)	Philanthropy is the dominant category of CSR activities. The next most common category of CSR activities includes those related to the business practices of the firm. The third category of CSR activities includes product-related features.	General customer behaviour	Conceptual	-	Social	Marketing
Pepper et al. (2009)	Socially conscious consumer behaviour, like its ecological counterpart, appears to be an expression of pro-social values. In contrast, frugal consumer behaviour relates primarily to low personal materialism and income constraints.	General customer behaviour	Empirical	UK; survey study with 2000 questionnaire s	Social/ Ecological	-
Perez (2009)	Shows that CSR-based consumer-company identification influences purchase intent through the mediator role of company attitude and company commitment.	Identification of sustainable customers	Empirical	-	Social	Sales
Perrini et al. (2009)	Italian customers interested in organics are more likely to trust the private-label organic products sold by a retailer when it is considered socially responsible; consumer trust translates into brand loyalty and a willingness to pay a premium price for organic products.	Consumer attitudes toward organic product	Empirical	IT; customers interested in organics	Ecological	Marketing
Piercy and Lane (2009)	Customers in upscale stores are more likely than discount/warehouse store customers to recognize signs designating organic foods. Younger people, women and those having larger household sizes recognized organic signage most often.	Customers' perceptions	Conceptual	-	Social	Marketing
Pujari and Wright (1996)	Companies in the UK have started internalizing the ecological externalities into their product strategies and a few of them have actually achieved success.	General customer behaviour	Empirical	UK/GER; case studies	Ecological	Marketing
Razzaque and Hwee (2002)	Ethicality of behaviour is culture-specific and reconfirms the existence of ethical relativism.	General customer behaviour	Empirical	SG; 500 purchasers	Social	Sales
Roberts (1996)	The ecologically conscious consumers of the 1990s differ from their predecessors. The consumers' beliefs that they, as individuals, can help solve environmental problems (perceived consumer effectiveness) was found to be the best predictor.	Ecologically conscious consumer behaviour	Empirical	US; 582 adult consumers of a nationwide survey	Ecological	Marketing
Rokka and Uusitalo (2008)	Consumers differ in their preferences for packaging, brand, price, and convenience of use of daily products.	Consumer environmental choice	Empirical	FIN; 330 consumers using	Ecological	Marketing/ Sales

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				functional drink products		
Román and Cuestas (2008)	Consumers' perceptions regarding the ethics of online retailers can be operationalized as a second-order construct composed of four dimensions: security, privacy, fulfilment, and non-deception.	Customers' perceptions	Empirical	ES; 357 online shoppers	Social	Marketing
Rothenberg (2007)	In an increasingly environmentally conscious and cost-conscious world, suppliers can make their business both more sustainable and more profitable by focusing on services that extend the efficiency and value of their products	-	Empirical	UK; interview with strategy managers from Gage Products, PPG Industries and Xerox	Social/ Ecological Economic	Services
Ruhwinkel and Wilde (2011)	When selling a sustainable product/service, a company has to remodel its CRM activities.	General customer behaviour	Conceptual	-	Social/ Ecological Economic	Overall
Russell and Russell (2010)	Unless consumers have a strong identity as global citizens, reciprocity in the form of increased patronage emerges only when CSR activities are conducted locally, even though consumers may express explicit approval of geographically distant CSR activities.	Consumer reactions to CSR initiatives	Empirical	US; 658 undergraduate students	Social	Marketing
Sammer and Wüstenhagen (2006)	Significant willingness to pay for A-labelled energy efficient products and brands are important.	General customer behaviour	Empirical	CH; 151 interviews conducted in Spring 2004	Ecological	Sales
Schmidt et al. (2010)	The market share for Green IT PCs could be increased. Especially female customers value environmentally friendly attributes.	General customer behaviour	Empirical	GER; 556 participants	Ecological	Marketing
Sheth et al. (2011)	Sustainability metric can emphasize the outcomes of business actions measured holistically in term of environmental, personal and economic well-being of the consumer.	General customer behaviour	Conceptual	-	Social/ Ecological/ Economic	Overall
Shrum et al (1995)	Green consumer are opinion leaders and careful shoppers who seek information on products, including information from advertising, but it is also suggested that the green consumer is rather sceptical of advertising.	General customer behaviour	Empirical	US; 3264 respondents to the DDB Needham Life Style Study	Ecological	Marketing

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Singh et al. (2008)	There is a weak impact of company-specific communication on consumer's perception.	Consumers degree of interest	Empirical	ES/UK; consumers	Social	-
Smith (2009)	Marketers would be well advised to follow Drucker's CSR principles as described here and, more fundamentally, his humanistic view of the business enterprise and their role within it.	General customer behaviour	Conceptual	-	Social	Marketing
Smith et al. (2010)	There are five propositions for practice that would help marketers correct the myopia: 1) map the company's stakeholders, 2) determine stakeholder salience, 3) research stakeholder issues and expectations and measure impact, 4) engage with stakeholders, and 5) embed a stakeholder orientation.	-	Conceptual	-	Social	Marketing
Tanner and Kast (2003)	Green food purchases are facilitated by positive attitudes of consumers toward (a) environmental protection, (b) fair trade, (c) local products, and (d) availability of action-related knowledge. Green behaviour is negatively associated with (e) perceived time barriers and (f) frequency of shopping in supermarkets.	General customer behaviour	Empirical	CH; 27 interviews with customers of a supermarket and an organic food store	Ecological	Sales
Thøgersen (2008)	Environmental labelling schemes are a supplement to – not a substitute for – general environmental awareness and self-confidence enhancing information and education efforts.	General customer behaviour	Empirical	EU; cross-national survey	Ecological	Sales
Vágási et al. (2003)	Programs put in place solely for sustainable development are vulnerable and may fail due to the lack of institutionalization.	General customer behaviour	Conceptual	Pharmaceutic al and the ICT industries.	Social/ Ecological/ Economic	Overall
Valor (2008)	Unless market failures are corrected, consumers will not be able to buy responsibly, and therefore, market incentives for CSR are seriously threatened.	Ability of consumers to buy responsibly	Conceptual	-	Social	Sales
Vanclay et al. (2011)	The overall change in purchasing pattern was small. However, when green-labelled products were also the cheapest, the shift was more substantial, with a 20% switch from black- to green-label sales.	General customer behaviour	Empirical	AUS; 37 products labelled to indicate embodied carbon emissions	Ecological	Sales
van Dam and Apeldoorn (1996)	Sustainability marketing requires finding optimal regulatory frameworks for governing the role of marketing within a	-	Conceptual	-	Social/ Ecological/ Economic	Marketing

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	confined ecological space.					
van Kempen et al. (2009)	A weak and indirect test of willingness to pay for green products. The results indicate that it is premature, if not unwarranted, to assume that the poor are not ready to make pro-ethical choices in the marketplace.	General customer behaviour	Empirical	GT; households in Guatemala	Social/ Ecological	Sales
Wagner vom Berg et al. (2011)	Approach sustainable multi-modal transportation by increasing the user's sustainability awareness using an adaptive application. The proposed application is strongly related to a CRM system since today CRM aims at increasing consumption of customers with the goal of profit maximization without integrating sustainability into CRM strategies, processes and systems.	General customer behaviour	Conceptual	-	Social/ Ecological/ Economic	Overall
Webster et al. (1975)	The socially conscious consumer can be distinguished by a variety of personality, attitude, and socioeconomic variables, although the relationships are rather weak.	General customer behaviour	Conceptual	-	Social	-
Wong et al.(2012)	This study contributes to the conceptual development of green service practices, the understanding of their impact on cost and environmental performance in supporting service-oriented firms to achieve such performance.	-	Conceptual	-	Ecological	Services
Young et al. (2010)	Incentives and single issue labels (like the current energy rating label) would help consumers concentrate their limited efforts.	General customer behaviour	Empirical	UK; Interviews with 81 self-declared green consumers	Ecological	-

II.2.8 References

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III Ausgewählte Aspekte der Integration von Kunden in Geschäftsprozesse

In Kapitel III werden verschiedene Aspekte der Integration von Kunden in Geschäftsprozesse dargestellt. Kundenintegration beschreibt dabei im Allgemeinen, dass Kunden „participate actively in the organization's work" (Lengnick-Hall et al. 2000). Die Konzepte "prosumption" (Toffler 1980; Kotler 1986), "customer as a part-time employee" (Bowen 1990), „customer participation" (Silpakit und Fisk 1985) oder "partial employees" (Bendapudi and Leone 2003) sowie die Begriffe „Co-Produzent (Ramirez 1999) und „Co-Designer" (Möller 2004) werden teilweise synonym verwendet, um den Sachverhalt der Kundenintegration zum Ausdruck zu bringen, implizieren aber jeweils verschiedene Verständnisse über die Rolle des Kunden. Die Beiträge 3 und 4 stellen in diesem Zusammenhang unterschiedliche Auswirkungen der Übernahme von Tätigkeiten, die zuvor im Verantwortungsbereich des Unternehmens lagen und die nun von Kunden übernommen werden, dar. Während Beitrag 3 die verschiedenen Kundenrollen und innovative Konzepte zur Umsetzung der Kundenintegration im Finanzdienstleistungsbereich fokusiert, steht in Beitrag 4 die ökonomische Bewertung der Kundenintegration im Vordergrund. Kapitel III zielt also insgesamt darauf ab, ein grundlegendes Verständnis über die Möglichkeiten der Kundenintegration zu schaffen und in den Beiträgen die genannten spezifischen Aspekte zu vertiefen.

III.1 Beitrag 3: „Kundenintegration in Geschäftsprozesse von Finanzdienstleistungsunternehmen“

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Zusammenfassung:

Die Integration von Kunden in Geschäftsprozesse gewinnt in jüngster Zeit auch bei Finanzdienstleistungsunternehmen insbesondere aufgrund des veränderten Kundenverhaltens und des verstärkten Einsatzes neuer Technologien zunehmend an Bedeutung. Für viele Unternehmen bleibt jedoch oftmals unklar, welche spezifische Rolle der Kunde dabei einnehmen und wie die Kundenintegration in Geschäftsprozesse tatsächlich ausgestaltet werden kann. Vor diesem Hintergrund zeigt der vorliegende Beitrag innovative Formen der Kundenintegration bei Banken und Versicherungen auf und kommt zu dem Ergebnis, dass Kunden auch dort sinnvoll in Geschäftsprozesse integriert werden können.

III.1.1 Bedeutung der Kundenintegration

Die Integration von Kunden in Geschäftsprozesse gewinnt seit einigen Jahren in der Praxis vermehrt an Bedeutung. Treiber für diese Entwicklung sind vor allem eine zunehmende Kundenorientierung und eine verstärkte Prozessorientierung in Unternehmen (Heidemann et al. 2011, S.119). Beide Trends werden in einer weltweiten Studie von Gartner, bei der ca. 1.600 CIOs befragt wurden, unter den zehn bedeutendsten zukünftigen Herausforderungen gesehen (Gartner 2010). In diesem Zusammenhang verändert sich die Art der Kundeneinbindung in Geschäftsprozesse im Rahmen der Dienstleistungserstellung (Meuter et al. 2000): So wandelt sich der Kunde immer mehr vom passiven Leistungsempfänger hin zum aktiven Aufgabenträger, der in Geschäftsprozesse eingebunden wird und diese durch von ihm zur Verfügung gestellte Ressourcen eigeninitiativ mit gestalten kann (Kleinaltenkamp 1997). Neue Technologien wie bspw. Selbstbedienungsterminals oder Self-Service-Funktionalitäten ermöglichen es, dass Kunden immer mehr Aufgaben ausführen können, die bisher im Tätigkeitsbereich von Unternehmensmitarbeitern lagen. Diese Entwicklungen forcieren nicht nur die Integration von Kunden in Geschäftsprozesse, sondern führen darüber hinaus auch zur Entstehung neuer Geschäftsmodelle und innovativer Produkte.

In der Praxis existieren bereits zahlreiche Beispiele, bei denen der Kunde zentral in den Geschäftsprozessen von Unternehmen verankert ist: So können Kunden bei Fluggesellschaften (z. B. Lufthansa) eigenständig ihre Buchungen vornehmen oder bei Stromanbietern (z. B. Yello Strom) ihr Kundenkonto eröffnen. Auch Supermärkte ermöglichen den Kunden immer öfter an Bezahlkassen ihre Einkäufe selbstständig abzurechnen. Darüber hinaus erlauben Behörden den Kunden vermehrt öffentliche Dienstleistungen wie die Anmeldung des Wohnsitzes in Eigenregie zu übernehmen. Bei Finanzdienstleistungsunternehmen ist die Integration des Kunden unterschiedlich stark verbreitet: So können Kunden auf der einen Seite dank der Einführung von Bankautomaten in den 1980er Jahren und mit der zunehmenden Verbreitung des Online-Bankings in den letzten Jahren immer mehr Bankdienstleistungen eigenständig durchführen (Meuter et al. 2000). Gleichzeitig erlauben Direktversicherungen dem Kunden zunehmend die vollständige Bearbeitung ausgewählte Geschäftsprozesse (bspw. den Abschluss einer KFZ-Versicherung oder die Meldung eines Haftpflichtschadens). Auf der anderen Seite finden innovative Geschäftsmodelle, die auf dem Konzept der Kundenintegration basieren, wie das „Social Banking“ der Fidor Bank AG oder die iCard der iCard Insurance Deutschland GmbH zur

Abwicklung von Schadensfällen bei Sachversicherungen, erst vereinzelt Verbreitung und sind noch wenig bekannt.

III.1.2 Begriffsdefinition und Formen der Kundenintegration

Die Kundenintegration in Geschäftsprozesse gewinnt nicht nur in der Praxis, sondern auch in der Wissenschaft bspw. im Innovationsmanagement oder im Marketing, zunehmend an Bedeutung. Der Begriff der Kundenintegration wird dabei in vielfacher Hinsicht verwendet. So existieren sehr unterschiedliche Begrifflichkeiten wie bspw. „Prosumer“, „Co-Produzent“, „Co-Designer“, „partial-employee“ oder auch „Customer Participation“ bzw. „Kundenbeteiligung“ (Bruhn und Stauss 2009, S. 10). Diese werden teilweise synonym verwendet, um den Sachverhalt der Kundenintegration zum Ausdruck zu bringen. Gleichzeitig implizieren sie auch unterschiedliche Verständnisse über die Aufgaben und Rollen von Kunden (vgl. bspw. Bruhn und Stauss 2009, S. 11-12). Trotz der Unterschiede ist den Begriffsauffassungen gemein, dass Kunden in die betrieblichen Leistungserstellungsprozesse eingebunden werden und diese aktiv mitgestalten können (Kleinaltenkamp 1997). So versteht man unter Kundenintegration nicht nur den „Prozess der systematischen Analyse, Planung, Durchführung und Kontrolle der aktiven Teilnahme von Kunden an unternehmerischen Prozessen“ (Bruhn und Stauss 2009), sondern auch eine spezielle Ausgestaltung der Kundenbeziehung, bei welcher der Kunde Aktivitäten und Prozesse übernimmt, die ursprünglich im Bereich des Unternehmens lagen. Darüber hinaus versteht Kleinaltenkamp unter Kundenintegration auch ein Managementkonzept, das „die Verschmelzung der Wertschöpfungsprozesse von Kunde und Anbieter fördert“ (Kleinaltenkamp 1996). Die genannten Definitionen verdeutlichen, dass sowohl Kunde als auch Prozess die konstituierenden Bestandteile der Kundenintegration darstellen. Diese beiden zentralen Begriffe sind auch Gegenstand des Crowdsourcing, dessen Konzept eng mit der Kundenintegration verwandt ist. Im Gegensatz zur Kundenintegration, die teilweise auch als „Outsourcing zum Kunden“ bezeichnet wird (Grün und Brunner 2002), wird beim Crowdsourcing, bei welchem Unternehmensaufgaben von einer undefiniert großen Gruppe von Personen außerhalb des Unternehmens wahrgenommen werden (Chard et al. 2010, S. 57), eine bedeutend höhere Anzahl potenzieller Partner für die Beteiligung an der Leistungserstellung angesprochen. Der Kunde wirkt daher nicht nur an der Erbringung der von ihm genutzten Leistungen mit, sondern schafft auch Wert für andere Kunden. Ein Beispiel für Crowdsourcing stellt bspw. die Entwicklung des Fiat Cinquecento im Rahmen der Kampagne „500 wants you“ dar, bei der potenzielle Kunden aktiv in die Ideenfindung für

Farbgestaltung, Ausstattungskonzepte und in die Mitgestaltung der Werbung eingebunden waren.

Neben den bisherigen Betrachtungen kommt auch der jeweiligen Rolle, die ein Kunde im Zusammenhang mit der Kundenintegration einnehmen kann, eine wichtige Bedeutung zu. So können Kunden im Geschäftsprozess verschiedene Tätigkeiten ausführen bzw. im Rahmen der Leistungserstellung unterschiedliche Funktionen übernehmen. Dabei kann sich die Rolle des Kunden im Verlauf eines Geschäftsprozesses verändern: So melden Kunden bspw. im Kontoeröffnungsprozess erst aktiv ihre persönlichen Daten und warten dann passiv auf die Ergebnisse der Bonitätsprüfung. Es lassen sich unterschiedliche Rollen des Kunden differenzieren, die vielfach in der Literatur analysiert werden. Hinsichtlich des Aktivitätsgrades und des Interaktionspartners können bspw. zehn Rollen des Kunden im Dienstleistungsprozess unterschieden werden (Chervonnaya 2003, S. 351 ff.): So nehmen Kunden eine passive Rolle ein, wenn sie entweder nicht aktiv am Prozess teilnehmen können („Inert“) oder sich bspw. aus Mangel an Zeit oder Motivation nicht beteiligen möchten („Idle“). Zudem kann der Kunde Rollen einnehmen, bei denen nicht die aktive Beteiligung an der Dienstleistungserstellung, sondern vielmehr die Bewertung der Prozessabläufe sowie der Prozessergebnisse („Auditor“) und die Kommunikation dieser Bewertung an Dritte („Marketer“) im Vordergrund stehen. Im Fokus des vorliegenden Beitrags stehen jedoch diejenigen Rollen, die Kunden im Prozess der Dienstleistungserstellung und der damit verbundenen Interaktion mit dem Unternehmen einnehmen können. Besitzen Kunden das Wissen über eine Dienstleistung, so kann das Unternehmen von ihnen lernen („Instructor“). Des Weiteren existiert der Fall, in dem Kunden nur spezifische Informationen zur Leistungserstellung beitragen („Ingredient“). Stellen Kunden dagegen Zeit und Aufwand in dem Maße zur Verfügung, dass die Dienstleistung ohne ihren Beitrag nicht hergestellt werden kann, produzieren sie die Dienstleistung mit („Co-Producer“ bzw. „Janus“). Können Kunden mit Self-Service-Funktionalitäten den Dienstleistungsprozess selbstständig ausführen, stehen sie damit sozusagen im Wettbewerb mit dem Unternehmen, das die gleiche Dienstleistung anbietet („Competitor“). Davon sind wiederum die Rollen zu unterscheiden, bei denen die Kunden die Rolle des Entscheidungsträgers wahrnehmen und damit bestimmen, ob sie die Dienstleistung produzieren oder nicht („Decision-maker“) oder welchen Produzenten sie auswählen („Hunter“). Abb. III-3 illustriert die verschiedenen Rollen des Kunden im Dienstleistungsprozess in Anlehnung an Chervonnaya graphisch.

Abb. III-1 Differenzierung der Rollen des Kunden

Zusammenfassend lässt sich festhalten, dass die Kundenintegration in der Literatur durch unterschiedliche Begrifflichkeiten charakterisiert ist und gleichzeitig verschiedene Rollen des Kunden impliziert. Insgesamt erfordert ein ganzheitliches Verständnis der Kundenintegration eine integrierte Betrachtung von Kunden- und Prozessperspektive. Diese Perspektiven werden bei der folgenden Darstellung dreier Beispiele aus der Finanzdienstleistungspraxis berücksichtigt.

III.1.3 Kundenintegration in der Finanzdienstleistungspraxis

Finanzdienstleistungsunternehmen bieten ihren Kunden schon seit einigen Jahren bspw. über Bankautomaten, Online-Banking oder Direktversicherungen zahlreiche Möglichkeiten in die Dienstleistungserstellung eingebunden zu werden. Seit Kurzem setzen zudem immer mehr Finanzdienstleistungsunternehmen innovative Konzepte zur Kundenintegration ein, um im zunehmenden Wettbewerb bestehen zu können und den wandelnden Kundenbedürfnissen gerecht zu werden. Im deutschen Bankensektor finden sich solch innovative Konzepte bspw. im Bereich des „Social Banking“ bei der FIDOR Bank AG (Kapitel III.2.3.1) oder bei dem Kreditportal smava (Kapitel III.2.3.2). Auch Versicherungsunternehmen bieten neue Produkte und Lösungen an, die eine zunehmende Integration des Kunden in die Geschäftsprozesse zur Folge haben, wie z. B. die Prepaid-Versicherung iCard (Kapitel III.2.3.3).

III.1.3.1 Beispiel Fidor Bank

Die FIDOR Bank AG (www.fidor.de) ist das erste mit einer Vollbank-Lizenz ausgestattete Unternehmen, das sein gesamtes Geschäftsmodell auf die Chancen des Social Web hin ausgerichtet hat. Mit dem Ziel der Kundenintegration hat die Bank die Kunden in ihrem Geschäftsmodell als gleichberechtigte Partner verankert und sie in die wesentlichen Entscheidungsprozesse eingebunden. Realisiert wird dies bspw. über Communities und Web 2.0-Anwendungen, wobei der Kommunikation mit den Kunden ein sehr hoher Stellenwert beigemessen wird (Höpner 2009, S. 23). Auf eigens dafür zugeschnittenen Portalen können Kunden über verschiedene Geldthemen diskutieren und von Experten oder erfahrenen Nutzern Empfehlungen erhalten (Höpner 2009, S. 23). Dabei wird jede messbare Aktivität des Kunden von Seiten der Bank „mit barer Münze“ entlohnt, um Anreize für ein aktives Kundenverhalten zu setzen. Dieses Geschäftsmodell einer „kundenzentrierten Bank“ (Buxton 2009) entspricht dem Wunsch der Kunden Finanzdienstleistungen ebenso mitzugestalten wie dies bereits bei einer Vielzahl von anderen Dienstleistungen im Internet (z. B. Hotelbewertung bei Holiday Check) möglich ist. Aus den genannten Bestrebungen sind zahlreiche Produktinnovationen, wie bspw. das im Folgenden dargestellte e-wallet entstanden.

Beim e-wallet handelt es sich um eine virtuelle Geldbörse, die zur Aufbewahrung verschiedener Formen elektronischen Geldes dient. Von diesem Guthaben-Konto können Kunden beim Online-Shopping bezahlen oder sich gegenseitig per SMS oder E-Mail Geld leihen. Dies hat für die FIDOR Bank AG eine Neugestaltung von Prozessen, wie bspw. zur Einrichtung und Verwaltung des e-wallet, zur Folge: Nachdem der Kunde sich mit seinen persönlichen Daten registriert hat, muss er diese in einem zweiten Anmeldeschritt selbstständig prüfen und bestätigen. Das Aufladen des e-wallet und die Verwendung des Geldes im e-wallet sind wesentlich vielfältiger gestaltbar als dies bei herkömmlichen Überweisungen der Fall ist (bspw. haben Kunden zusätzlich die Möglichkeit, Geldsendungen ihrer Freunde aus der Community der FIDOR Bank AG anzunehmen oder diesen Freunden Geld zu leihen). Die folgende Prozessdarstellung in Abb. III-4 (die vom Kunden durchgeführten Prozessschritte sind dabei grau hinterlegt) illustriert den Einrichtungs- und Verwaltungsprozess des e-wallet im Vergleich zum Prozess der Eröffnung und Verwaltung eines Girokontos, wie er bei einer klassischen Filialbank existiert. Auch wenn die beiden Produkte nicht vollständig miteinander vergleichbar sind, lässt sich erkennen, welch bedeutende Rolle dem Kunden im Rahmen der e-wallet-Prozessabwicklung zukommt.

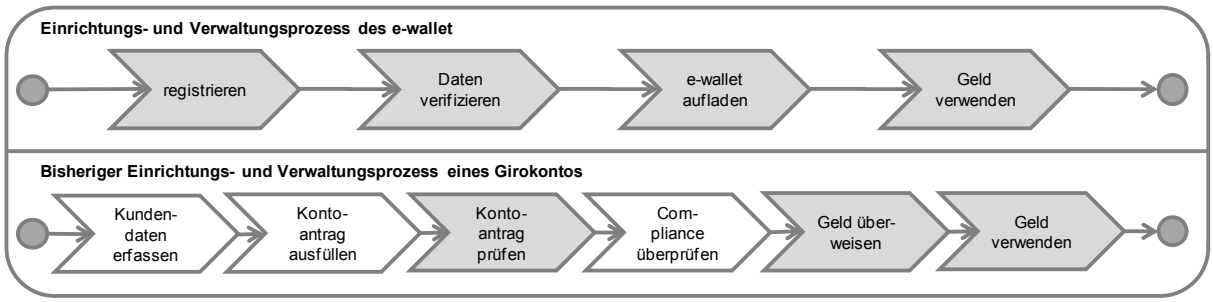

Abb. III-2 Einrichtungs- und Verwaltungsprozess des e-wallet

Insgesamt zeigt sich, dass die Kunden in die Prozesse der FIDOR Bank AG deutlich stärker eingebunden sind als dies bei traditionell aufgestellten Kreditinstituten der Fall ist. Auch definiert die FIDOR Bank AG durch ihr Geschäftsmodell die Rolle des Kunden weitgehend neu: So sind die Kunden einerseits in der Rolle des „Competitor“ zu sehen, da diese sämtliche Prozessaktivitäten übernehmen können und eigenständig entscheiden, welchen Beitrag sie leisten möchten (bspw. wie oft sie das e-wallet nutzen) und gleichzeitig von ihrem Beitrag selbst profitieren (bspw. über das Bonussystem der Community der FIDOR Bank AG). Andererseits nutzt die FIDOR Bank AG auch die Erfahrungen der Kunden, um sie in der Rolle des „Ingredient“ in der Community Produkt- und Dienstleistungsideen generieren zu lassen. Da die Plattform den Kunden zudem die Möglichkeit zum Austausch untereinander bietet, wird der Kunde durch die Wertung der angebotenen Leistungen darüber hinaus zum „Auditor“ und in der Kommunikation mit Dritten zum „Marketer“. Aufgrund der Tatsache, dass Kunden nicht nur als gleichberechtigte Partner Ideen und Lösungen für das Unternehmen identifizieren, sondern ebenfalls neue Vorschläge diskutieren können, wird deutlich, dass dem Geschäftsmodell der FIDOR Bank AG nicht nur die Idee des „Social Banking“, sondern auch die des Crowdsourcings zugrunde liegt.

III.1.3.2 Beispiel smava

Auch beim zurzeit größten deutschen Kreditportal smava (www.smava.de), das seit der Gründung 2008 Kredite im Volumen von 32 Millionen Euro vermittelt hat (Bender 2010, S. 1), übernehmen die Kunden eigenständig zahlreiche Aufgaben. Der Online-Marktplatz folgt dem Konzept des selbstbestimmten und transparenten Kreditmarktes (Hackhausen 2009, S. 1), auf dem Kreditnehmer und Anleger entscheiden können, mit wem und wie sie ihre Geldgeschäfte tätigen. Das Angebot von smava richtet sich speziell an Kreditnehmer mit guter bis mittlerer Bonität, die einen Online-Kredit suchen sowie an Selbstständige und Kunden, die Geldgeschäfte gerne direkt, transparent und selbstbestimmt tätigen. Die Kreditvergabe läuft wesentlich einfacher ab als beim klassischen Kreditinstitut: Wer Geld

benötigt, stellt sich und sein Vorhaben im Internet vor, bietet einen Zinssatz an und wartet, bis sich genügend Geldgeber finden, die das Vorhaben mit einem Teilbetrag mitfinanzieren (Bender 2010, S. 1). Smava kann darüber hinaus auch bessere Konditionen als klassische Kreditinstitute anbieten, da sich Kreditnehmer und Anleger die Spanne zwischen Einlagen- und Kreditzins aufteilen. Für die Abwicklung dieser Transaktionen arbeitet smava mit der Bank für Investments und Wertpapiere zusammen (Hackhausen 2009, S. 1). Im Gegensatz zum e-wallet handelt es sich hier nicht um ein neuartiges Produkt, für welches neue Prozesse eingeführt werden müssen. Vielmehr handelt es sich hierbei um die Anpassung existierender Prozesse (z. B. Kreditvergabe- und Finanzierungsprozess) an die Herausforderungen, die mit einer zunehmenden Kundenintegration verbunden sind. Der Kreditvergabe- und Finanzierungsprozess zeichnet sich durch zwei verschiedene Gruppen von aktiven Kunden aus – Kreditnehmer und Anleger –, die den Prozess initiieren und diesen fast vollständig ausführen können: Bei der Anmeldung, die der Kreditnehmer eigenständig durchführt, wählt er den gewünschten Kreditbetrag. Nach Einsendung der Identifikations- und Bonitätsnachweise (z. B. Einkommensbescheinigungen) werden die Unterlagen des Kreditnehmers geprüft. Ist eine positive Prüfung erfolgt, wird der Kreditwunsch auf dem Marktplatz angezeigt und Anleger können Kreditangebote abgeben. Smava übernimmt die Auszahlung des Geldes an den Kreditnehmer ebenso wie die Abbuchung der Raten und die Gutschrift beim Anleger. Abb. III-5 zeigt den Kreditvergabe- und Finanzierungsprozess bei smava im Vergleich zu dem Prozess bei einem klassischen Kreditinstitut auf.

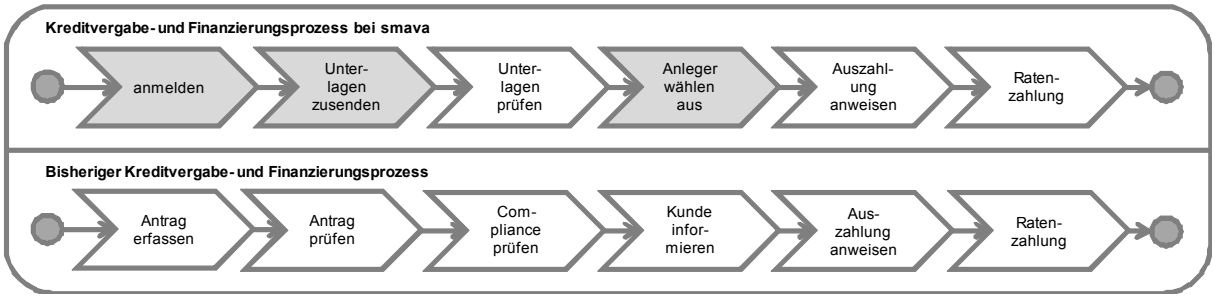

Abb. III-3 Kreditvergabe- und Finanzierungsprozess

Im Gegensatz zum Prozess der FIDOR Bank AG kann der Kunden bei smava nicht den gesamten Geschäftsprozess übernehmen. Vielmehr ist die Integration des Kunden bei smava auf bestimmte Aktivitäten bzw. Teilprozesse beschränkt. Damit ist der Kunde als „Janus“ zu sehen, der mit seinem zielgerichteten Beitrag an der richtigen Stelle im Prozess einen Mehrwert z. B. an Produktivität schaffen kann. Die Aufgabe des Unternehmens hierbei ist es, den Beitrag des Kunden so zu steuern, dass dieser Mehrwert entstehen kann.

III.1.3.3 Beispiel iCard24

Die iCard Insurance Deutschland GmbH hat in Zusammenarbeit mit der Ergo Direkt Versicherung im Jahr 2009 mit den iCards (www.i-card24.de) ein neues innovatives Produkt auf den Markt gebracht. Bei den iCards handelt es sich um Prepaid-Versicherungen mit einer Laufzeit von 12 Monaten, für die Kunden bei Abschluss im Voraus bezahlen und damit den ausgewählten Gegenstand bspw. ein Mobiltelefon, eine Kamera, ein Laptop oder ein Fahrrad versichern. Alle diese Gegenstände lassen sich mit Hilfe einer Seriennummer eindeutig identifizieren. Die Nummer des zu versichernden Geräts und die Nummer der iCard lassen eine eindeutige Zuordnung von Versicherungsnehmer und -gegenstand zu. Die Kunden können ihren Gegenstand gegen Diebstahl sowie gegen Schäden durch Fall, Sturz, Wasser, Feuchtigkeit, Überschwemmung, Blitzschlag, Brand, Frost und höhere Gewalt versichern.

Obwohl mit dieser Produktinnovation nicht primär das Ziel der Kundenintegration verfolgt wird, ermöglicht die damit verbundene Umgestaltung der Prozesse einen weitreichenden Einbezug des Kunden. Somit unterscheidet sich der Prozess des Versicherungsabschlusses und der Schadensabwicklung der iCard auch hier deutlich vom bisherigen Prozess bei klassischen Versicherungsunternehmen: So wählen Kunden in einem ersten Schritt selbstständig die für sie und ihre Bedürfnisse passende Konfiguration der iCard aus, bestellen diese und registrieren sich mit Angabe der Versicherungs- und Seriennummer bei der iCard Insurance Deutschland GmbH. Im Schadensfall genügen das Ausfüllen des Online-Schadensformulars und die Vorlage beim regionalen Servicepartner für die Regulierung des Schadens. Abb. III-6 stellt den Antrags- und Schadensabwicklungsprozess der iCard dem vergleichbaren Prozess bei einer traditionellen Versicherung gegenüber.

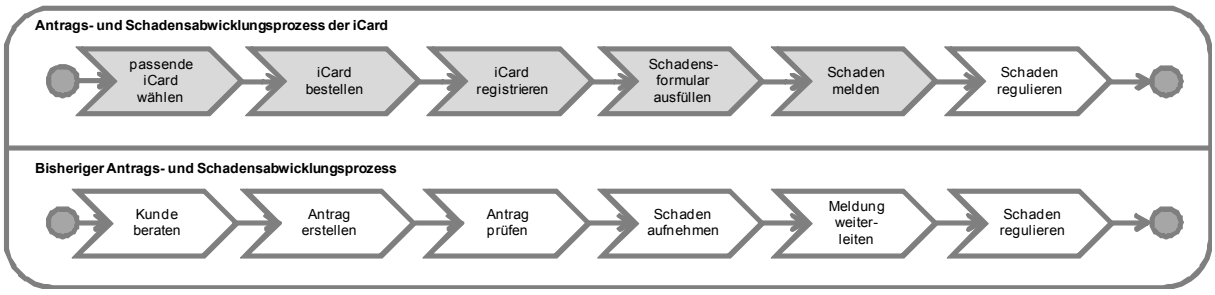

Abb. III-4 Antrags- und Schadensabwicklungsprozess der iCard

Die iCard Insurance Deutschland GmbH ermöglicht ihren Kunden den gesamten Prozess bis zur Schadensregulierung selbstständig auszuführen. Sie benötigen keine Unterstützung von Versicherungsmitarbeitern im Prozess. Alleine die Schadensregulierung, welche eine

Kernaufgabe jedes Versicherungsunternehmens ist, kann der Kunde nicht durchführen. Den Kunden kommt somit im Prozess bis zur Schadensregulierung die Rolle des „Competitor“ zu.

III.1.4 Chancen und Risiken der Kundenintegration

Die bisherigen Ausführungen illustrieren, dass Finanzdienstleistungsunternehmen vermehrt Kunden in ihre Geschäftsprozesse integrieren. Für Unternehmen sind mit der Integration des Kunden Chancen, aber auch Risiken verbunden. Die im Folgenden beispielhaft aufgeführten Chancen und Risiken spielen besonders für die vorgestellten Unternehmen eine wichtige Rolle, stellen jedoch nur eine Auswahl aller denkbaren Chancen und Risiken der Integration von Kunden in Geschäftsprozesse von Finanzdienstleistungsunternehmen dar.

Unternehmen versprechen sich durch die Kundenintegration eine Reihe von positiven Effekten, einerseits im Hinblick auf die Kundenbeziehung und andererseits auch auf die Effektivität und Effizienz ihrer Geschäftsprozesse. Die Kundenintegration führt in Unternehmen dazu, dass eigentlich unternehmensexterne Kunden durch die Mitwirkung an der Leistungserstellung enger mit dem Unternehmen verbunden sind und teilweise als unternehmensinterne Ressource betrachtet werden können. Kunden können dann – wie bspw. über die Communities der Fidor Bank – den Erstellungsprozess der Dienstleistung begleiten, mitgestalten sowie ihr Wissen beisteuern. Damit erhöht sich nicht nur die Qualität der Produkte bzw. Dienstleistungen (Enkel et al. 2005, S. 203), sondern das Leistungsangebot wird damit individualisierter auf die Bedürfnisse der Kunden zugeschnitten, was letztlich die Zufriedenheit der Kunden sowie deren Loyalität erhöht und dadurch auch das Image des Unternehmens verbessert.

Gleichzeitig streben Unternehmen mit der Umsetzung der Kundenintegration Prozessverbesserungen und in diesem Zusammenhang Kosteneinsparungen an. So begünstigt die Einführung der iCard24 eine Aufteilung der anfallenden Tätigkeiten im Sinne einer Arbeitsteilung, da sich ein Sachbearbeiter bspw. mit wertschöpfenderen Tätigkeiten als der Schadensmeldung des Kunden beschäftigen kann. Da sich die Integrationspartner damit auf die jeweiligen Kernkompetenzen konzentrieren können, verbessert sich die Effizienz der Geschäftsprozesse.

Neben den bedeutenden Chancen, die mit der Kundenintegration einhergehen, existieren jedoch auch Risiken: Vor dem Hintergrund, dass Unternehmen mit der Kundenintegration das Ziel verfolgen, Kunden langfristig in die Geschäftsprozesse einzubinden und der Beitrag der Kunden damit wesentlicher Bestandteil für das Produkt bzw. die Dienstleistung wird, machen

Unternehmen sich zunehmend von den Leistungen der Kunden abhängig (Enkel et al. 2005, S. 203). So ist sowohl im Geschäftsmodell der Fidor Bank als auch bei smava der Kunde und seine Interaktion mit anderen Kunden kritisch für den Geschäftserfolg, da ohne die Beteiligung der Kunden diese Finanzdienstleistung nicht entstehen kann.

Darüber hinaus müssen Unternehmen sich darüber bewusst sein, dass Kunden sich nur selten zu Mitarbeitern des Unternehmens entwickeln und daher als externe Ressourcen, deren leistungsrelevante Eigenschaften und Verhaltensweisen (z. B. in den Communities der Fidor Bank) ungewiss bleiben, schwierig zu steuern und zu planen sind. Dabei kann der Einbezug von Kunden die Komplexität in der Leistungserstellung zum Teil erheblich erhöhen und die Flexibilität der Prozesse deutlich reduzieren, was u. a. aus dem erhöhten Koordinationsaufwand, der bspw. aufgrund der vermehrten Schnittstellen zwischen den Beteiligten entsteht, resultiert.

Zusammenfassend lässt sich festhalten, dass Finanzdienstleister (aber auch andere Unternehmen) für eine fundierte Entscheidung über die Kundenintegration in Geschäftsprozesse die damit einhergehenden Chancen und Risiken gegenüberstellen und abwägen müssen. Dabei gilt es insbesondere die spezifischen Branchen-, Unternehmens- und Wettbewerbsrahmenbedingungen zu berücksichtigen.

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III.2 Beitrag 4: „Die Integration des Kunden in Geschäftsprozesse – ein ökonomisches Modell und dessen Anwendung am Beispiel eines Versicherungsunternehmens “

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Zusammenfassung:

Die Integration des Kunden in Geschäftsprozesse gewinnt seit einigen Jahren zunehmend an Bedeutung. Unternehmen versprechen sich dadurch nicht nur Kosteneinsparungen, sondern auch eine höhere Kundenbindung. Welche ökonomischen Auswirkungen durch die Kundenintegration für Unternehmen tatsächlich entstehen, bleibt jedoch meist unklar. Vor diesem Hintergrund wird die Notwendigkeit einer ex ante Bewertung der Kundenintegration in Geschäftsprozesse deutlich. Zudem werden bis dato damit verbundene Investitionsentscheidungen meist aus Sicht des Customer Relationship Managements oder aus Sicht des Prozessmanagements getroffen. Eine integrierte Betrachtung beider Sichtweisen findet nur unzureichend statt. Vor diesem Hintergrund wird in diesem Beitrag ein quantitatives Entscheidungsmodell entwickelt, mithilfe dessen Entscheidungen über die Integration des Kunden in Geschäftsprozesse ökonomisch fundiert getroffen werden können. Die praktische Anwendung des Modells wird am Beispiel eines international tätigen deutschen Versicherungsunternehmens veranschaulicht.

III.2.1 Einleitung

Eine stärkere Kundenorientierung gewinnt seit einigen Jahren als Wettbewerbsfaktor insbesondere in Dienstleistungsunternehmen zunehmend an Bedeutung (Rust et al. 2005). Zur Steigerung der Flexibilität bezüglich des Marktgeschehens unterziehen sich Unternehmen gleichzeitig einem organisatorischen Wandel von einer funktionalen zu einer prozessorientierten Organisation (Haarländer et al. 2005). Dies bestätigt auch das Marktforschungsunternehmen Gartner in der weltweiten Studie „Leading in Times of Transition: The 2010 CIO Agenda“, bei der ca. 1.600 CIOs befragt wurden. Diese sehen unter den zehn bedeutendsten Herausforderungen die Verbesserung von Geschäftsprozessen ebenso wie die effektivere Kundenansprache und die profitable Gestaltung von Kundenbeziehungen (Gartner 2010).

Ausgehend von dieser Entwicklung wandelt sich der Kunde immer mehr vom passiven Leistungsempfänger zum aktiven Aufgabenträger, der bspw. über Self-Services in das Unternehmen integriert wird (Rohrbeck et al. 2010). Kundenintegration bedeutet dabei, dass der Kunde durch von ihm zur Verfügung zu stellende sogenannte externe Faktoren in betriebliche Leistungserstellungsprozesse eingebunden wird und diese aktiv mitgestalten kann (Kleinaltenkamp 1997). In der Realwirtschaft ist der Kunde schon seit einigen Jahren zentral in den Geschäftsprozessen von Unternehmen verankert: So kann der Kunde bspw. in Buchungssystemen von Fluggesellschaften (z. B. Lufthansa) selbst aktiv werden oder bei Stromanbietern wie z. B. Yello Strom sein Kundenkonto eigenständig eröffnen (Gronover et al. 2002). Aber auch bei Finanzdienstleistern wie z. B. der Fidor Bank kann der Kunde selbstständig Festgeldanlagen vornehmen oder mit anderen Kunden Ratschläge austauschen. Versicherungen ziehen nach und bieten innovative Produkte wie z. B. die iCard24 der ERGO Direkt Versicherungen an – eine Prepaid-Versicherung, die der Kunde selbstständig abschließt, und bei der er zudem die Meldung und Abwicklung von Schadensfällen übernimmt. Diese Beispiele zeigen die Bedeutung, die dem Thema Kundenintegration in der aktuellen Unternehmenspraxis in vielfacher Hinsicht zukommt.

Unternehmen verfolgen auf der einen Seite durch die Integration des Kunden in Geschäftsprozesse das Ziel, Prozessverbesserungen und damit Kosteneinsparungen zu erzielen (Sharma und Tzokas 2002). Auf der anderen Seite versprechen sie sich eine erhöhte Kundenbindung (Chow et al. 2008) sowie eine Steigerung der Kundenzufriedenheit (Burghard und Kleinaltenkamp 1996) und andere positive Effekte auf die Kundenbeziehung.

Dabei erfolgt, wie bei zahlreichen anderen Projekten im Customer Relationship Management (CRM), selten ein Monitoring oder eine Erfolgskontrolle der Maßnahmen (Capgemini 2010). Oftmals bleibt daher unklar, mit welchen ökonomischen Auswirkungen die Kundenintegration für Unternehmen verbunden ist. Ebenso bleibt meist unberücksichtigt, dass selbst kostenintensive Investitionsprojekte nicht den gewünschten Erfolg generieren (Rigby und Ledingham 2004) und teilweise sogar zu großen finanziellen Schäden für Unternehmen führen können (Enkel et al. 2005). Bisher existieren jedoch sowohl in der Wissenschaft als auch in der Praxis kaum quantitative Ansätze zur Bewertung der Kundenintegration in Geschäftsprozesse. Dieser Mangel an Bewertungsverfahren resultiert zudem in teilweise intransparenten Bewertungsergebnissen und kann dazu führen, dass faktisch unwirtschaftliche Projekte umgesetzt werden. Dies kann durch eine fundierte, ökonomische Bewertung verhindert werden. Ziel des Beitrags ist daher die Entwicklung eines quantitativen Entscheidungsmodells, mit dessen Hilfe Entscheidungen über die Integration des Kunden in Geschäftsprozesse ökonomisch fundiert getroffen werden können. Hierfür ist eine integrierte Betrachtung sowohl aus der Perspektive des Prozessmanagements als auch aus der Sicht des CRM unabdingbar.

Der Beitrag ist wie folgt aufgebaut: In Abschnitt 2 wird der Stand der Forschung zur Kundenintegration in Geschäftsprozesse vorgestellt. Im darauf folgenden Abschnitt 3 wird mithilfe eines formal-deduktiven Vorgehens (Wilde und Hess 2007) ein quantitatives Modell entwickelt, das es ermöglicht Entscheidungen über die Integration des Kunden in Geschäftsprozesse ökonomisch fundiert zu treffen. Darauf aufbauend wird in Abschnitt 4 die Anwendbarkeit des Modells am Beispiel eines großen deutschen Versi-cherungsunternehmens illustriert. Abschnitt 5 fasst die Ergebnisse schließlich zusam-men, würdigt diese kritisch und zeigt weiteren Forschungsbedarf auf.

III.2.2 Stand der Forschung

Die zunehmende Bedeutung der Kundenintegration in Geschäftsprozesse in der Praxis führt auch in der Wissenschaft zu zahlreichen Beiträgen aus unterschiedlichsten be-triebswirtschaftlichen Disziplinen. So wird Kundenintegration in der Literatur z. B. im Innovationsmanagement, in der Produktentwicklung bspw. im Zusammenhang mit Mass Customization oder auch im Marketing, wo der Kunde als Co-Marketer aktiv werden kann (Martin et al. 2001), thematisiert. Zudem existieren verschiedene Begrifflichkeiten wie bspw. „Prosumer“ (Toffler 1980), „Co-Produzent (Ramirez 1999), „Co-Designer“ (Möller 2004),

„partial-employee“ (Schneider und Bowen 1983) oder auch „Customer Participation“ (Silpakit und Fisk 1985) bzw. „Kundenbeteiligung“, die teilweise synonym verwendet werden, um den Sachverhalt der Kundenintegration zum Ausdruck zu bringen, aber auch unterschiedliche Verständnisse über die Rolle des Kunden implizieren. Den Begriffsauffassungen ist gemein, dass der Nachfrager einer Sach- oder Dienstleistung an der Leistungserstellung des Anbieters mitwirkt (Fließ 2001). Kleinaltenkamp versteht unter Kundenintegration sogar ein Managementkonzept, das die Verschmelzung der Wertschöpfungsprozesse von Kunden und Anbieter fördert (Kleinaltenkamp 1996). Im Gegensatz zum Crowdsourcing, bei dem Unternehmensaufgaben von einer undefi-niert großen Gruppe von Personen außerhalb des Unternehmens wahrgenommen werden (Howe 2009), ist die Kundenintegration, bei welcher der Kunde nur an der Erbringung der von ihm genutzten Leistungen mitwirkt, enger gefasst. Betrachtet man speziell Dienstleistungen, so ist die Kundenintegration sogar konstituierendes Merkmal, da diese erst durch die Integration des Kunden bzw. seiner Information in den Geschäftsprozess erbracht werden können (Bruhn 2008). Insgesamt wird deutlich, dass der Untersuchungsgegenstand Kundenintegration in zahlreichen Kontexten und Forschungsbereichen thematisiert wird. Die genannten Definitionen veranschaulichen, dass sowohl Kunde als auch Prozess wesentliche Bestandteile der Kundenintegration sind. Um den modellbasierten Ansatz dieses Beitrags einordnen zu können, sind daher vor allem Forschungsarbeiten aus Prozessmanagement und CRM von Bedeutung.

Aus der Forschung zum Prozessmanagement, welches die Planung, Durchführung und Kontrolle von Geschäftsprozessen zum Gegenstand hat (Becker et al. 2005), wurden verschiedene Ansätze zur Prozessbewertung entwickelt, die auch für die Bewertung der Kundenintegration relevante Methoden liefern können. Trotz der Tatsache, dass ein Großteil der Arbeiten zur Prozessbewertung konzeptioneller bzw. qualitativer Natur sind (z. B. Kueng und Kawalek 1997; Nissen 1994), existieren dennoch Ansätze zur quantitativen Bewertung von Geschäftsprozessen, die jeweils unterschiedliche Bewertungsgegenstände fokussieren: So werden das Prozessdesign bzw. Prozessmodelle u. a. von Heinrich et al. (2009a), Balasubramanian und Gupta (2005) und Neiger et al. (2006) durch quantitative Metriken bzw. Algorithmen bewertet. Auch Yang et al. beurteilen Sourcingentscheidungen auf quantitative Weise (Yang et al. 2007). Darüber hinaus bewerten Braunwarth et al. Automatisierungsentscheidungen anhand barwertiger Cashflows und gehen damit über die reine Orientierung an kurzfristig ausgerichteten Größen wie dem Periodengewinn hinaus

(Braunwarth et al. 2010). Für die Prozessbewertung existieren somit vereinzelt quantitative Vorgehensweisen, deren grundlegende Konzepte eine Basis für die Bewertung der Kundenintegration bilden können. Weiterer Methoden bedient sich bspw. Das (2009), der Metriken zur Bewertung der Kundenintegration in den Supply Chain Management Prozess unter der Prämisse der Gewinnmaximierung betrachtet. Weiter analysieren Engelhardt und Freiling das Ausmaß der Kundeneinflussnahme in Prozesse anhand der Eingriffsintensität (Engelhardt und Freiling 1995). Darüber hinaus gehen Kleinaltenkamp und Schweikart auf das Controlling der Kundenintegration näher ein und erweitern die traditionelle Prozesskostenrechnung zu einer flexiblen und kundenbezogenen Variante, welche bspw. mehrere Kosteneinflussgrößen zulässt (Kleinaltenkamp und Schweikart 2006). Insgesamt gibt es damit in der Literatur zum Prozessmanagement erste Ansätze zur quantitativen Prozessbewertung und zur Betrachtung der Kundenintegration, wobei Auswirkungen auf den Kunden bisher nur unzureichend berücksichtigt werden. Eine Verknüpfung der beiden Disziplinen Prozessmanagement und CRM bei der Bewertung wird nur selten bspw. von Heinrich und Leist, die sich mit dem Design von Kundenbeziehungsprozessen auseinander setzen, forciert (Heinrich et al. 2009b). Dies ist umso erstaunlicher, als das mit der Definition des Begriffs Geschäftsprozess nach Hammer und Champy die hohe Relevanz eines Prozesses aus Unternehmens- und Kundensicht betont wird (Hammer und Champy 1993; vom Brocke et al. 2009).

Neben den Arbeiten aus dem Prozessmanagement wird das Thema Kundenintegration auch in Forschungsbeiträgen zum CRM beleuchtet. Dabei wird die Integration des Kunden als eine spezielle Ausgestaltung der Kundenbeziehung verstanden, bei welcher der Kunde Aktivitäten und Prozesse übernimmt, die ursprünglich im Bereich des Unternehmens lagen (Wikström 1996). Die Literatur im Bereich CRM zum Thema Kundenintegration ist überwiegend charakterisiert durch konzeptionelle und qualitative Beiträge: So analysieren Piller et al. Erfolgsfaktoren der Kundenintegration im Bereich der Mass Customization (Piller et al. 2004). Darüber hinaus evaluiert Jacob, ob die Kundenintegrationskompetenz, d. h. die Fähigkeit eines Unternehmens, Maßnahmen zur Kundenintegration umzusetzen, als Erfolgsfaktor für die Individualisierung von Dienstleistungen verwendet werden kann (Jacob 2006). Weitere Arbeiten zum Thema Kundenintegration im CRM beschäftigen sich mit der Konzeptualisierung und Operationalisierung des Integrationsverhaltens von Anbieter und Nachfragern (Büttgen 2007), mit dem Spektrum möglicher Integrationsausprägungen (Corsten 2000), aber auch mit den unterschiedlichen Integrationswirkungen auf die

Leistungserstellung (Meyer 2001). Im Gegensatz zu diesen meist qualitativen Arbeiten zum Thema Kundenintegration lassen sich in der CRM-Literatur allgemein zahlreiche Beiträge zu anderen Themengebieten identifizieren, bei denen sowohl der Customer Lifetime Value als auch der Customer Equity als zentrale Bewertungs- und Steuerungsgrößen verwendet werden (z. B. Heiligenthal und Skiera 2007; Rust et al. 2004). Während der Customer Lifetime Value der Summe der diskontierten Ein- und Auszahlungen über die Dauer einer Kundenbeziehung entspricht (Ber-ger und Nasr 1998), ist der Customer Equity definiert als die Summe der diskontierten Ein- und Auszahlungen aller Kundenbeziehungen über ihre Bindungsdauer an ein Unternehmen (Rust et al. 2004). Diese beiden zentralen Bewertungsgrößen finden – trotz der Tatsache, dass es sich beim Thema Kundenintegration um ein intensiv untersuchtes Forschungsfeld im CRM handelt – bisher in der CRM-Literatur zur Kundenintegration keinen Eingang. Unabhängig von der Frage nach einer sinnvollen Bewertungsgröße findet zwar eine qualitative Auseinandersetzung mit dem Thema Kundenintegration statt, auf eine umfassende Bewertung der Kundenintegration nach quantitativen Kriterien wird bisher jedoch verzichtet.

Insgesamt lässt sich daher festhalten, dass sowohl im Prozessmanagement als auch im CRM erste Ansätze zur Bewertung der Kundenintegration in Geschäftsprozesse vorhan-den sind und dabei das Konstrukt Kundenintegration aus unterschiedlichen Perspektiven betrachtet wird. Allerdings existiert nach Kenntnis der Autoren bisher kein Ansatz, der einerseits die ökonomischen Auswirkungen der Kundenintegration in Geschäftsprozesse quantitativ bewertet und andererseits die zwingend erforderliche Verknüpfung der Disziplinen Prozessmanagement und CRM fokussiert. Vor diesem Hintergrund wird im folgenden Abschnitt ein ökonomisches Entscheidungsmodell entwickelt, welches die Kundenintegration in Geschäftsprozesse sowohl aus einer Kunden- als auch einer Prozessperspektive ökonomisch bewertet.

III.2.3 Entscheidungsmodell

Um zu identifizieren, wo in einem Geschäftsprozess der Kunde unter ökonomischen Gesichtspunkten als Aufgabenträger integriert werden soll, wird im Folgenden ein quantitatives Entscheidungsmodell entwickelt. Das Modell basiert auf der Überlegung, Maßnahmen zur Kundenintegration als Investitionen zu betrachten. Dabei wird untersucht, ob die potenziellen Einsparungen im Prozessbetrieb (*Prozesswirkung*) und die mögliche Cashflow-Wirkung der Kundenintegration auf den Kunden (*Kundenwirkung*), die für das gesamte Projekt notwendigen Investitionsauszahlungen rechtfertigen. Als

Bewertungskriterium wird der Barwert der resultierenden Ein- und Auszahlungen herangezogen (Perridon et al. 2009). Dabei wird keine fallabhängige Prozesskonfiguration für einzelne Prozessinstanzen (Prozessdurchläufe) bestimmt, sondern der Beitrag fokussiert vielmehr die Gestaltung von Prozessmodellen. Dem Modell liegen verschiedene Annahmen und Definitionen zugrunde, die im Folgenden erläutert werden.

Bevor ermittelt werden kann, ob die Integration von Kunden in einen spezifischen Prozessschritt unter ökonomischen Gesichtspunkten sinnvoll ist, müssen folgende Bedingungen erfüllt sein:

B1: Da bestimmte Prüf-, Kontroll-, Planungs-, Steuerungs- und Unterstützungsaufgaben im Unternehmen verbleiben müssen, kann der Gesamtprozess nicht vollständig durch den Kunden übernommen werden.

B2: Aufgaben, die für das Unternehmen von strategischer Bedeutung sind (bspw. Aufgaben, durch die Unternehmenswissen preisgegeben würde), können nicht durch den Kunden durchgeführt werden.

B3: Eine Selbstselektion der Kunden sorgt dafür, dass der Kunde nur dann Aufgaben übernimmt, wenn für ihn dadurch ein subjektiv wahrnehmbarer Wert bzw. Nutzen[1] entsteht.

Sind diese Bedingungen erfüllt, kann der Kunde prinzipiell in die Geschäftsprozesse eines Unternehmens integriert werden. Dies bedeutet, dass der Kunde in spezifische Geschäftsprozesse eingebunden wird und diese von Unternehmen und Kunden gemeinsam durchgeführt werden. Betrachtet wird ein einzelner Geschäftsprozess eines Unternehmens, wobei die Wechselwirkungen mit anderen Geschäftsprozessen nicht betrachtet werden. Ein Geschäftsprozess ist dabei definiert als eine Menge von Aktivitäten in einem Kontrollfluss, der eine Reihenfolgebeziehung festlegt (Hammer und Champy 1993). In einem Kontrollfluss können Verzweigungen und Zusammenführungen auftreten. Es wird dabei von einem schleifenfreien Prozess ausgegangen. Die parallele Ausführung von Teilprozessen wird nicht betrachtet. Ein Teilprozess p_i (mit $i = 1, 2, ..., n$) ist dabei definiert als eine Teilmenge der Gesamtmenge von Aktivitäten eines Prozesses. In einem Geschäftsprozess kann ein Teilprozess entweder nur vom Kunden oder nur vom Unternehmen durchgeführt werden,

[1] Dabei handelt es sich um den Customer Value (vgl. Graf und Maas 2008; Woodruff 1997) bzw. den wahrgenommen Kundenwert aus Nachfragersicht (vgl. Matzler 2000). Dessen detaillierte Betrachtung ist jedoch nicht Gegenstand der weiteren Untersuchung.

jedoch nicht von beiden.[2] Die Entscheidungen über alternative Bearbeitungsmöglichkeiten werden an prozessualen Entscheidungsknoten getroffen. Davon sind die fachlichen Entscheidungsknoten zu unterscheiden, an denen die Eigenschaften des Prozessinputs (z. B. Kundengruppe des Kunden, der einen Antrag stellt) die weitere Bearbeitungsweise bestimmen (Braunwarth et al. 2010). Da an jedem prozessualen Entscheidungsknoten im Prozess eine Bearbeitungsweise gewählt wird, ergeben sich somit unterschiedliche Prozessvarianten, die im Folgenden als Integrationsvarianten bezeichnet werden. Eine Integrationsvariante d_k (mit $k = 1, 2, ..., 2^n$), die als Vektor $\vec{d}_k = (p_1, p_2, \dots, p_n) \in \{0,1\}^n$ dargestellt werden kann, ergibt sich aus einer bestimmten Abfolge von Teilprozessen, bei der an jedem prozessualen Entscheidungsknoten des Geschäftsprozesses ein bestimmter Bearbeitungsmodus gewählt wird. Für einen speziellen Teilprozess p_i gilt $p_i = 0$ falls keine Kundenintegration im betrachteten Teilprozess p_i stattfindet und $p_i = 1$ falls der Kunde den Teilprozess p_i ausführt. Dabei gilt aufgrund der Bedingungen B1 und/oder B2, dass die Integrationsvariante $\vec{d}_k = (1, 1, \dots, 1)$ nicht zulässig ist.

Für die Bestimmung der optimalen Integrationsvariante $\vec{d}_k^*$, die aufzeigt, welche Teilprozesse der Kunde unter ökonomischen Gesichtspunkten als Aufgabenträger übernehmen soll, wird der Barwert aller der Kundenintegration zurechenbaren Zahlungsveränderungen erfasst. Dabei sind Ein- und Auszahlungen vor der Durchführung des Projekts zur Kundenintegration nicht relevant, was im Sinne einer Differenzinvestitionsbetrachtung die Komplexität der Bewertung reduziert. Im Folgenden wird zwischen Investitionsauszahlungen für die Maßnahmen zur Kundenintegration, den dadurch induzierten Zahlungsveränderungen im Prozessbetrieb (*Prozesswirkung*) sowie den entstehenden ökonomischen Auswirkungen auf das Kundenverhalten (*Kundenwirkung*) unterschieden. Bei den betrachteten Zahlungsgrößen handelt es sich um deterministische und barwertige Größen.

Für die Umsetzung der Kundenintegration fallen im Unternehmen unterschiedliche Investitionsauszahlungen an: So sind einerseits Investitionsauszahlungen $I_i \in \mathbb{R}_-$ zu tätigen, die einem Teilprozess p_i zurechenbar sind (z. B. Auszahlungen für den Aufbau neuer Infrastruktur, den Ausbau bestehender Infrastruktur oder für die Bereitstellung neuer Software-Funktionalitäten). Der Vektor $\vec{I} = (I_1, I_2, \dots, I_n) \in \mathbb{R}_-^n$ fasst die teilprozessspezifischen Investitionsauszahlungen zusammen. Andererseits fallen

[2] Es findet unternehmensseitig keine Unterscheidung zwischen personellen und maschinellen Aufgabenträgern statt (vgl. Grob et al. 2008).

Investitionsauszahlungen $I^{\text{ges}}(\vec{d}_k)$ an, welche keinem Teilprozess, sondern einer spezifischen Integrationsvariante $\vec{d}_k$ zurechenbar sind. Mögliche Auszahlungen umfassen hier bspw. Investitionsauszahlungen für das Projektmanagement (z. B. für Projektplanung und -kontrolle), das Change Management (z .B. für Schulungen der Vertriebsmitarbeiter) und das Geschäftsprozessmanagement (z. B. für die Anpassung der Geschäftsprozesse). Da je nach Projekt diese Maßnahmen aufgrund eines längeren Umsetzungszeitraums nicht alle sofort zahlungswirksam werden müssen, wird der Barwert der Auszahlungen erfasst. Damit ergibt sich die gesamte Investitionsauszahlung I_k einer Integrationsvariante $\vec{d}_k$ wie folgt:

$$I_k = \vec{d}_k \cdot \vec{I} + I^{\text{ges}}(\vec{d}_k) \quad (1)$$

Wobei

I_k: Gesamte Investitionsauszahlung einer Integrationsvariante $\vec{d}_k$

$\vec{I}$: Vektor der teilprozessspezifischen Investitionsauszahlungen

$I^{\text{ges}}(\vec{d}_k)$: Investitionsauszahlungen, die einer Integrationsvariante $\vec{d}_k$ zurechenbar sind

Neben den Investitionsauszahlungen sind für die Bewertung der Kundenintegration die Veränderungen der Ein- und Auszahlungen im Prozessbetrieb ΔB (*Prozesswirkung*) zu berücksichtigen. Es besteht ein Unterschied in der Zusammensetzung und Höhe dieses Bestandteils, je nachdem ob der Teilprozess p_i vom Kunden oder unternehmensseitig durchgeführt wird. Es existieren teilprozessspezifische Veränderungen der Ein- und Auszahlungen $\Delta B_i \in \mathbb{R}$, welche als Vektor $\overrightarrow{\Delta B} = (\Delta B_1, \Delta B_2, \dots, \Delta B_n) \in \mathbb{R}^n$ darstellbar sind. Dazu zählen u. a. die Auszahlungen für Personal, Material, Miete und Wartung. Im Bezug auf die Personalauszahlungen kann es sich bspw. positiv auf die Effizienz des Unternehmens auswirken, dass der Kunde Aufgaben ausführt, die eigentlich durch die Mitarbeiter ausgeübt werden (Hoffmann und Bateson 1997). Gleichzeitig müssen aber im Unternehmen verstärkt Service- und Supportleistungen z. B. für die Bearbeitung einer gestiegenen Anzahl von Kundenanfragen zur Verfügung gestellt werden (Zeithaml und Bitner 2000). Außerdem resultiert die Integration des Kunden in zusätzlichen fachlichen Schnittstellen zwischen Unternehmen und Kunden, deren Betrieb und Management mit Auszahlungen für das Unternehmen verbunden ist. Diese mit der fachlichen Schnittstelle in Verbindung stehenden

Auszahlungen fallen bspw. beim Eingreifen von Servicemitarbeitern in die Bearbeitung oder für die Aufbereitung von Daten zur Erfüllung von Sicherheitsstandards bezüglich sensibler Kundendaten an (Fridgen und Heinrich 2005). Je komplexer die Einbindung des Kunden an einer fachlichen Schnittstelle ist, desto höhere Auszahlungen fallen im Unternehmen für die fachliche Abstimmung und technische Integration an. Diese Auszahlungen für den Betrieb und das Management der fachlichen Schnittstelle zwischen zwei aufeinander folgenden Teilprozessen p_i und p_j ($1 \leq i < j \leq n$) werden in einer *nxn*-Matrix Z erfasst. Die einzelne Komponente $Z_{ij} \in \mathbb{R}$ spiegelt dabei die Auszahlung wider, die mit der fachlichen Schnittstelle zwischen den Teilprozessen p_i und p_j in Verbindung steht. Es gilt außerdem: $Z_{ii}=0$ ($1 \leq i \leq n$). Es sind alle fachlichen Schnittstellen des vom Kunden ausgeführten Teilprozesses mit allen direkt vorgelagerten und nachfolgenden Teilprozessen (aufgrund von Zusammenführungen oder Verzweigung können dies mehrere sein) zu berücksichtigen. Dafür ist die Summation aller Auszahlungen, die mit den betrachteten fachlichen Schnittstellen in Verbindung stehen, notwendig.

Die gesamten Veränderungen der Ein- und Auszahlungen für den Prozessbetrieb ΔB_k einer spezifischen Integrationsvariante $\vec{d}_k$ ergeben sich aus der Veränderung der Ein- und Auszahlungen für den Prozessbetrieb, die einem Teilprozess p_i direkt zurechenbar sind und der mit den fachlichen Schnittstellen in Verbindung stehenden Auszahlungen wie folgt:

$$\Delta B_k = \vec{d}_k^T \cdot \overrightarrow{\Delta B} + \vec{d}_k^T \cdot G \cdot \vec{d}_k \qquad (2)$$

Wobei

ΔB_k:	Gesamte Veränderung der Ein- und Auszahlungen für den Prozessbetrieb einer Integrationsvariante $\vec{d}_k$
$\overrightarrow{\Delta B}$:	Veränderung der teilprozessspezifischen Ein- und Auszahlungen für den Prozessbetrieb
G:	Matrix der Auszahlungen, die mit den fachlichen Schnittstellen zwischen aufeinanderfolgenden Teilprozessen in Verbindung stehen

Die Matrix G fasst die Auszahlungen, die mit den betrachteten fachlichen Schnittstellen in Verbindung stehen, aus Matrix Z für alle möglichen Schnittstellen zusammen:

$$G = \begin{pmatrix} \sum_{q=1}^{n} Z_{1,q} & 0 & 0 & \dots & 0 \\ -2Z_{2,1} & \sum_{q=1}^{n} Z_{2,q} & 0 & \dots & 0 \\ 0 & -2Z_{3,2} & \sum_{q=1}^{n} Z_{3,q} & \dots & \dots \\ \dots & \dots & \dots & \dots & 0 \\ 0 & \dots & 0 & -2Z_{n,n-1} & \sum_{q=1}^{n} Z_{n,q} \end{pmatrix} \quad (3)$$

Auf der Diagonalen der Matrix G steht die Summe aller mit den fachlichen Schnittstellen in Verbindung stehenden Auszahlungen für den Fall, dass jeweils ein einzelner Teilprozess p_i vom Kunden ausgeführt wird. Falls der Kunde in aufeinanderfolgende Teilprozesse integriert wird und dadurch an diesen Stellen die Schnittstellen zwischen Kunde und Unternehmen entfallen, werden die mehrfach berücksichtigten Auszahlungen eliminiert (Subtrahenden auf der ersten Nebendiagonale). Im zweiten Summanden von Gleichung (2) stellt die Multiplikation der Matrix *G* mit dem Vektor der Integrationsvariante $\vec{d}_k$ und dem transponiertem Vektor $\vec{d}_k^T$ sicher, dass aus der Matrix *G* genau die Elemente für die Teilprozesse ausgewählt werden, die vom Kunden durchgeführt werden (d. h. p_i=1).

Abschließend sind für die Bewertung der Kundenintegration die Veränderungen der Ein- und Auszahlungen, die mit dem Kunden in Verbindung stehen (*Kundenwirkung*) zu berücksichtigen, da die Kundenintegration deren Verhalten – bspw. ihre Bindung an das Unternehmen, ihr Weiterempfehlungsverhalten, aber auch ihre Zahlungsbereitschaft – verändern kann. Diese Veränderungen der kundenbezogenen Ein- und Auszahlungen werden mittels der Veränderung des Customer Equity $\Delta CE_k \in \mathbb{R}$ quantifiziert und sind zu trennen von den Veränderungen der Ein- und Auszahlungen für den Prozessbetrieb, welche bereits in der Größe ΔB_k erfasst sind.[3] Das resultierende, für den Kunden subjektiv wahrnehmbare „Gesamtprozesserlebnis“ (Meuter et al. 2005) kann dabei unterschiedlich sein, je nachdem welche Teilprozesse der Kunde ausführt. Für jede Integrationsvariante $\vec{d}_k$ ergibt sich somit

[3] Obwohl beide Veränderungen der Ein- und Auszahlungen durch den Kunden induziert sind, werden in diesem Ansatz die Effekte separat erfasst. Da die Kunden- und Prozessperspektive im Fokus des vorliegenden Beitrags stehen, sind die Auswirkungen der Kundenintegration auf die unternehmensinternen Abläufe von der Auswirkung auf den Kunden zu trennen.

eine unterschiedliche Veränderung des Customer Equity $\Delta CE(\vec{d}_k)$. Hat der Kunde einer Versicherung bspw. die Möglichkeit seinen Versicherungsantrag fallabschließend zu bearbeiten, kann dies einen positiveren Effekt auf die Kundenbindung und damit auf sein zukünftiges Zahlungsverhalten haben, als die einfache Eingabe seiner Kundendaten. Daraus folgt für die gesamte Veränderung des Customer Equity ΔCE_k einer Integrationsvariante $\vec{d}_k$:

$$\Delta CE_k = \Delta CE(\vec{d}_k) \tag{4}$$

Für die Bestimmung der optimalen Durchlaufvariante $\vec{d}_k^*$, die aufzeigt, welche Teilprozesse der Kunde unter ökonomischen Gesichtspunkten als Aufgabenträger übernehmen soll, wird der barwertige Gesamtcashflow $CF_k \in \mathbb{R}_0$ einer Integrationsvariante $\vec{d}_k$ ermittelt. Er ergibt sich aus der Summe der Investitionsauszahlungen I_k, den Veränderungen der Ein- und Auszahlungen für den Prozessbetrieb ΔB_k und den Veränderungen des Customer Equity ΔCE_k:

$$\Delta CF_k = I_k + \Delta B_k + \Delta CE_k \tag{5}$$

Anhand der näheren Spezifikation von (5) durch das Einsetzen von (1), (2) und (4) ergibt sich der barwertige Gesamtcashflow CF_k einer Integrationsvariante $\vec{d}_k$ wie folgt:

$$\Delta CF_k = \vec{d}_k \cdot \vec{I} + I^{\text{ges}}(\vec{d}_k) + \vec{d}_k^T \cdot \overrightarrow{\Delta B} + \vec{d}_k^T \cdot G \cdot \vec{d}_k + \Delta CE(\vec{d}_k) \tag{6}$$

Strebt das Unternehmen nach der Maximierung des Gesamtcashflows CF_k, so kann die optimale Integrationsvariante $\vec{d}_k^*$ folgendermaßen bestimmt werden:

$$\vec{d}_k^* = \arg\max_k CF_k \tag{7}$$

Da im vorliegenden Beitrag nicht einzelne Aktionen eines Unternehmens, sondern Teilprozesse, in denen bereits mehrere Aktionen zusammengefasst sind, bei der Bewertung der Kundenintegration betrachtet werden und grundsätzlich nur bestimmte Teilprozesse für die Kundenintegration in Frage kommen (vgl. Bedingungen B1-B3), kann die maximale Anzahl der Integrationsvarianten 2^n auf eine übersichtliche Anzahl reduziert werden. Somit ist die Ermittlung der optimalen Integrationsvariante $\vec{d}_k^*$ durch kombinatorische Verfahren oder bspw. durch vollständige Enumeration über alle realisierbaren Integrationsvarianten möglich. Welche Algorithmen zur Bestimmung der optimalen Integrationsvariante in höherdimensionalen Fällen herangezogen werden, hängt davon ab, welche zusätzlichen

Eigenschaften die einzelnen Zahlungsbestandteile besitzen. Insgesamt erlaubt das vorliegende Entscheidungsmodell, diejenigen Prozessschritte eines Unternehmens zu identifizieren, in die der Kunde unter ökonomischen Gesichtspunkten als Aufgabenträger integriert werden soll und stellt somit einen ersten Ansatz zur ökonomischen Bewertung der Kundenintegration in Geschäftsprozesse dar.

III.2.4 Anwendung des Modells

Im Folgenden wird am Beispiel eines Versicherungsunternehmens das in Abschnitt III.1.3 vorgestellte Entscheidungsmodell zur ökonomischen Bewertung der Kundenintegration in Geschäftsprozesse angewendet und dessen praktischer Nutzen illustriert.

III.2.4.1 Das Versicherungsunternehmen

Das global tätige deutsche Versicherungsunternehmen bietet seinen Kunden umfassende hochwertige Lösungen in den Bereichen Sach-, Lebens- und Krankenversicherung an. Es verfolgt das Ziel einer verstärkten Kundenintegration in seine Geschäftsprozesse, um den Kunden bspw. durch den Aufbau spezifischen Know-hows langfristig an das Unternehmen zu binden und auf diese Weise Lock-in-Effekte zu erzielen. Die Integration des Kunden wird dabei mittels Self-Services realisiert, wobei der Schwerpunkt bisher auf der reinen Information des Kunden (wie die Durchführung der Vertrags- und Postkorbverwaltung) lag. Ein großer Unterschied besteht zudem zwischen den verschiedenen Versicherungssparten: Während Kunden in der Sachversicherung die zuvor genannten Funktionalitäten durchführen können, wird dies im Bereich Lebens- und Krankenversicherung bisher kaum ermöglicht. Daher sehen die befragten Experten aus dem Bereich Marktmanagement diesbezüglich noch deutliches Entwicklungspotenzial. Ziel der Voranalyse ist die Evaluation, ob es ökonomisch sinnvoll ist, bestimmte Teilprozesse des Antragsprozesses vom Kunden ausführen zu lassen.

III.2.4.2 Datenerhebung

Die verwendeten Daten wurden im Rahmen dieser Arbeit mithilfe qualitativer Expertenbefragungen erhoben und aus Vertraulichkeitsgründen anonymisiert und leicht modifiziert, wobei die grundsätzlichen Ergebnisse erhalten geblieben sind. Die Befragung der Expertengruppe, bestehend aus Vertretern unterschiedlicher Unternehmensbereiche (u. a. IT, Betriebsorganisation, Controlling und Marktmanagement) in Verbindung mit Erfahrungswissen und theoretischen Erkenntnissen lieferte folgende Informationen für die Voranalyse der Kundenintegration in den betrachteten Prozess: Bei den Projektauszahlungen

wird vereinfachend davon ausgegangen, dass aufgrund des absehbaren Umsetzungszeitraums von ca. einem Jahr alle Projektkosten sofort zahlungswirksam werden. Es sind im Unternehmen bisher weder die Software-Funktionalitäten noch die Infrastruktur, die für die Kundenintegration benötigt werden, vorhanden. Die Experten gaben zudem an, dass im Rahmen des Change Management neben Schulungen von Mitarbeitern des Kundensupports (Call Center) auch eine Veränderung des Provisionsmodells des Vertriebs umzusetzen sei. Ausgangspunkt für die Angaben der Experten zum Geschäftsprozessmanagement waren ihre Erfahrungswerte, welche zahlungsmäßigen Veränderungen mit der Anbindung von neuen Vertriebskanälen verbunden sind. Das Management der fachlichen Schnittstellen zwischen Kunde und Unternehmen sei nach Auskunft der Experten außerdem besonders dann von Bedeutung, wenn im Betrieb ein Eingreifen von Servicemitarbeitern notwendig ist. Zu den Veränderungen des Customer Equity merkten sie an, dass es sich dabei um eine zukunftsorientierte Zielgröße handelt, deren Veränderung nur schwer quantifizierbar ist. Bisher konnte daher der Gesamtwert der Kundenwirkung im Unternehmen nicht vollständig kalkuliert werden, so dass in diesem Fall theoretische Erkenntnisse und Erfahrungen in die Berechnung einfließen. Aus diesem Grund wurde eine vereinfachende Kundenwertanalyse durchgeführt. Der durchschnittliche Kundenwert eines Versicherungskunden ermittelt sich dabei aus den drei Kennzahlen Kundenbindung, Kundenpotenzial und Kundenrentabilität und konnte über alle Kunden hinweg zum Customer Equity aggregiert werden. Dieser Wert dient als Ausgangsbasis, um die Veränderungen des Customer Equity durch die Kundenintegration abzuschätzen. Außerdem wurden die unterschiedlichen erwarteten Veränderungen im Verhalten der Kunden bspw. in ihrem Weiterempfehlungs-, Bindungs- und Wiederkaufsverhalten erfasst. Zusätzlich wurden Kunden in einer Befragung gebeten, ebenfalls ihre Verhaltensänderungen einzuschätzen, falls sie einen Teilprozess selbstständig durchführen können. Eine Übersicht der zur Anwendung des Modells benötigten Informationen sowie u. a von den Experten verwendete Informationsquellen illustriert Tab. III-1.

Tab. III-1 Zahlungsveränderungen im betrachteten Antragsprozess

Teilprozesse / Eingabewerte in TEUR	Beratung	Auswahl Vertrags-gestaltung	Antrags-erstellung	Antragsüber-mittlung	Informationsquelle
Investitionszahlungen (einmalig)					
Bereitstellung Infrastruktur (Hardware)	[-10; -4]* -7**	[-4; -2] -3	[-8; -4] -6	[-5; -3] -4	Erfahrungswerte der IT-Abteilung
Bereitstellung Funktionalitäten (Software)	[-75; -65] -70	[-40; -20] -30	[-70; -50] -60	[-45; -35] -30	Erfahrungswerte der IT-Abteilung und Anwendung von Aufwandschätzungsverfahren
Projektmanagement	[-300; -100] -200				Beratungsverträge und Erfahrungswerte der Abteilung Betriebsorganisation
Change Management	[-75; -25] -50				Erfahrungswerte der Abteilungen Betriebsorganisation, IT und Marktmanagement
Geschäfts-prozessmanagement	[-155; -165] -160				Erfahrungswerte der Abteilungen Betriebsorganisation und IT
Ein- bzw. Auszahlungen für Prozessbetrieb (p. a.)					
Management der fachlichen Schnittstelle zum Kunden	[1; 3] 2	[1,5; 2,5] 2	[4; 8] 6	[3,5; 4,5] 4	Erfahrungswerte der Abteilungen Betriebsorganisation und IT
Personal	[-8; -4] -6	[1; 3] 2	[7; 9] 8	[5; 9] 7	Tagessatz der Mitarbeiter aus den Zahlen des Controllings/ Erfahrungswerte zu den notwendigen Bearbeitungszeiten
Material und Miete	[3; 5] 4	[2; 4] 3	[7,5; 8,5] 8	[5; 7] 6	Erfahrungswerte der Abteilung Betriebsorganisation
Wartung/ Aktualisierung	[-3; -1] -2	[0,5; 1,5] 1	[-6; -4] -5	[-5; -3] -4	Bei manueller Ausführung: Tagessatz und notwendige Bearbeitungszeit; bei automatischer Ausführung: Erfahrungswerte der IT-Abteilung
Veränderung des Customer Equity (p. a.)					
Veränderungen im Kundenverhalten	[120; 160] 140				Abschätzung aus Kundenbefragungen und Erfahrungswerte zu den unterschiedlichen Teileffekten betreffend das Weiterempfehlungs- und Bindungsverhalten der Kunden

III.2.4.3 Prozessbewertung anhand des Antragsprozesses

Im Folgenden wird die Integration des Kunden in den Antragsprozess des betrachteten Versicherungsunternehmens analysiert und der resultierende Cashflow ermittelt. Bisher wird

der Kunde noch nicht in den Antragsprozess integriert. Die Kundenintegration kann jedoch aufgrund der Tatsache, dass die Gestaltung der Beratungs- und Antragsfunktionalität (bspw. im Bezug auf Benutzerfreundlichkeit und Aktualität) das Außenbild des betrachteten Versicherungsunternehmens entscheidend beeinflusst, deutliche ökonomische Auswirkungen haben. Im Folgenden werden in Anlehnung an (Sittaro et al. 2008) die Teilprozesse p_i des Antragsprozesses für einfache, nicht beratungsintensive Produkte für Privatkunden (z. B. eine Privat-Haftpflichtversicherung) kurz beschrieben. Ausgangspunkt der Betrachtung sind Kunden, die einen Versicherungsvertrag abschließen möchten. Die *Beratung* und die Festlegung der passenden *Konfiguration der Vertragsgestaltung* (bspw. die Bestimmung der Höhe der Selbstbeteiligung in der KFZ-Versicherung) sind dabei Grundlage für die *Antragserstellung*. Obwohl traditionellerweise Vermittler den Kunden in Beratungsgesprächen über das Produkt informieren, können Kunden sowohl die Information über die Versicherungsprodukte also auch die Anpassung der Verträge auf ihre spezifischen Bedürfnisse bspw. mittels geeigneter Beratungsapplikationen selbstständig übernehmen. Auch die *Antragsübermittlung* wird standardmäßig durch den Kundenberater vorgenommen, kann aber ebenso vom Kunden ausgeführt werden. Nachdem der Antrag der korrekten Bearbeitungsstelle zugewiesen wurde und die Ablage der Kundendokumente im Dokumentenmanagement des Unternehmens vorgenommen wurde, erfolgen nach der Antragserfassung abschließend eine Risikoprüfung und die Erstellung der Vertragsdokumente, welche entweder aus Vertraulichkeitsgründen im Postkorb des Kunden hinterlegt werden oder ihm in gedruckter Form zugestellt werden. Da diese Prüf- und Steuerungstätigkeiten durch das Unternehmen durchgeführt werden müssen, kann man sie im Teilprozess *Antragsbearbeitung* zusammenfassen. Aus den unterschiedlichen möglichen Bearbeitungsweisen für die 4 Teilprozesse, in die der Kunde eingebunden werden kann, resultieren 2^4=16 mögliche Integrationsvarianten. Abb. III-1 illustriert den Antragsprozess graphisch. Die Abbildung ist an die UML 2.0-Notation für Aktivitätsdiagramme angelehnt, wobei es sich bei den dargestellten Entscheidungsknoten ausschließlich um prozessuale Entscheidungsknoten handelt.

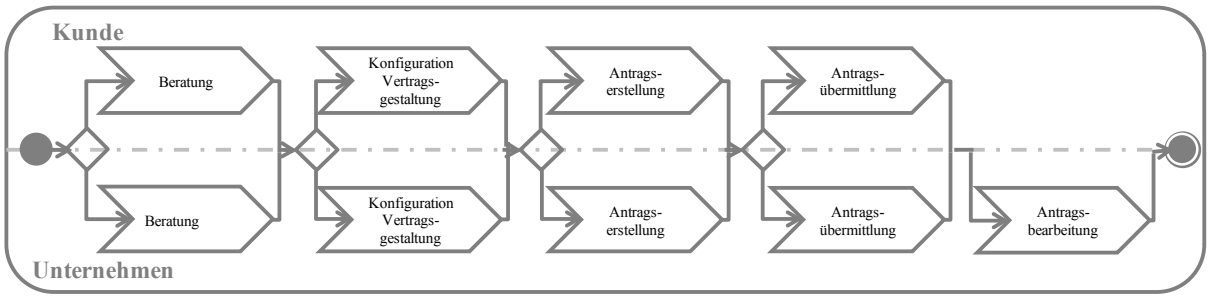

Abb. III-1 Antragsprozess

Damit für den betrachteten Antragsprozess diejenigen Teilprozesse p_i identifiziert werden können, in die der Kunde unter ökonomischen Gesichtspunkten als Aufgabenträger integriert werden soll, muss das Versicherungsunternehmen alle Zahlungsveränderungen für jeden Teilprozess p_i mit potentieller Kundenintegration erfassen. In dem Fall, dass eine Zurechenbarkeit zum Teilprozess p_i in dem Versicherungsunternehmen aufgrund eines zu hohen Aufwands nicht möglich ist (z. B. bei den Auszahlungen für das Projektmanagement), wird der Wert für den Gesamtprozess erfasst. Aufgrund der unterschiedlichen fachlichen Spezialisierungen und Erfahrungen der befragten Experten resultieren unterschiedliche Einschätzungen zur Höhe der anfallenden Zahlungen in Euro. Daher werden in Tab. III-1 die Bandbreiten der Expertenschätzungen durch die Angabe von gerundeten Minimal- und Maximalwerten in tausend Euro in eckigen Klammern angegeben (z. B. Becker et al. 2005; Braunwarth et al. 2010). Für die weitere Berechnung wird der Mittelwert verwendet, welcher für jeden Teilprozess unterhalb der jeweiligen Bandbreite angegeben ist.

Aus allen möglichen realisierbaren Integrationsvarianten wählt das Versicherungsunternehmen nun ex ante diejenige Integrationsvariante $\vec{d}_k^*$ aus, die den höchsten Gesamtcashflow generiert. Für die Berechnung des barwertigen Cashflows (vgl. Formel (6)) wird der projektspezifische Kalkulationszins von 6% für den Kalkulationszeitraum von 5 Jahren unterstellt. Diese Daten stammen ebenfalls aus den Befragungen der Experten des betrachteten Unternehmens. Abb. III-2 zeigt eine Übersicht aller möglichen Integrationsvarianten $\vec{d}_k$ und den jeweils resultierenden Gesamtcashflow. Dabei werden die vom Kunden ausgeführten Teilprozesse in dunkelgrau dargestellt.

Integrationsvariante		Gesamtcashflow
1		-200.000 €
2		94.306 €
3		180.430 €
4		185.341 €
5		190.492 €
6		95.005 €
7		99.916 €
8		105.067 €
9		186.040 €
10		191.190 €
11		196.101 €
12		100.615 €
13		110.677 €
14		196.800 €
15		105.765 €
16		111.376 €

Abb. III-2 Integrationsvarianten und Gesamtcashflows

Der negative Gesamtcashflow der Integrationsvariante 1 ergibt sich dadurch, dass zwar Investitionsauszahlungen für die Umsetzung der Kundenintegration anfallen, jedoch keine Einzahlungen generiert werden. Dies resultiert daher, dass nur Zahlungsveränderungen betrachtet werden, die der Kundenintegration zurechenbar sind. Unter den gegebenen Rahmenbedingungen werden bei der optimalen Integrationsvariante ($\vec{d}_k^*$=14), die einen Gesamtcashflow von 196.800 € erzielt, die Teilprozesse *Auswahl der Vertragsgestaltung*, *Antragserstellung* und *Antragsübermittlung* vom Kunden ausgeführt. Die *Beratung* sollte demnach durch das Versicherungsunternehmen selbst vorgenommen werden. Vor dem Hintergrund, dass es sich bei diesem Unternehmen wie bei den meisten Versicherungen um komplexe und erklärungsbedürftige Produkte handelt und fehlende Erläuterungen bspw. durch einen Vermittler dazu führen können, dass der Kunde keinen Vertrag abschließen wird, ist es aus ökonomischer Sicht bei diesem Unternehmen sinnvoll, diesen Teilprozess nicht vom Kunden durchführen zu lassen. Die übrigen Teilprozesse können dagegen durch geeignete Applikationen technisch so unterstützt werden, dass der Kunde die Funktionalitäten eigenständig ausführen kann.

Die Erkenntnisse der vorliegenden Analyse bilden die Ausgangsbasis für eine mögliche Durchführung und Umsetzung der Kundenintegration in den betrachteten Antragsprozess. Zusammenfassend ermöglicht das vorgestellte Entscheidungsmodell zur ökonomischen Bewertung der Kundenintegration dem Versicherungsunternehmen, diejenigen Teilprozesse zu identifizieren, in die der Kunde unter ökonomischen Gesichtspunkten als Aufgabenträger integriert werden soll. Damit ist es dem Versicherungsunternehmen möglich, zielgerichtet in diejenigen Teilprozesse zu investieren, in denen sich die Kundenintegration ökonomisch positiv auswirkt.

III.2.5 Zusammenfassung und Ausblick

Die Integration des Kunden in Geschäftsprozesse gewinnt in der aktuellen Unternehmenspraxis in vielfacher Hinsicht an Bedeutung. Oftmals bleibt jedoch unklar, mit welchen ökonomischen Auswirkungen die Kundenintegration für ein Unternehmen verbunden ist. Vor diesem Hintergrund wurde im vorliegenden Beitrag ein quantitatives Entscheidungsmodell zur ökonomischen Bewertung der Kundenintegration in Geschäftsprozesse entwickelt, das einerseits die ökonomischen Auswirkungen bewertet und andererseits die zwingend erforderliche integrierte Betrachtung von Prozess- und Kundenperspektive fokussiert. Mithilfe des Modells ist es möglich, diejenigen Prozessschritte eines Unternehmens zu identifizieren, in die der Kunde unter ökonomischen Gesichtspunkten als Aufgabenträger integriert werden soll. Die praktische Anwendung des Modells wurde am Beispiel eines Versicherungsunternehmens illustriert.

Trotz des Mehrwerts, den der vorliegende Beitrag an der Schnittstelle von CRM und Prozessmanagement liefert, existieren verschiedene Limitationen. So ist die Annahme deterministischer Zahlungsgrößen im Modell kritisch zu sehen. Obwohl Entscheidungen in der Praxis oft auf der Annahme sicherer Zahlungsströme basieren, trifft dies nur auf wenige Fälle zu. Inhalt weiterführender Forschungsansätze sollte es daher sein, die Erweiterung um eine Risikobetrachtung vorzunehmen, um unsichere Entwicklungen zukünftiger Zahlungen in der Realität bspw. aufgrund des vorhandenen Betrugspotenzials von Seiten der Kunden besser abbilden zu können. Auch die in diesem Beitrag ausgeblendeten Wechselwirkungen zwischen Geschäftsprozessen, sollten Gegenstand zukünftiger Forschungsarbeiten sein. Darüber hinaus ist im Rahmen der praktischen Anwendbarkeit zu berücksichtigen, dass die exakte Zurechenbarkeit zum jeweiligen Teilprozess bzw. zum Gesamtprozess in der Praxis nicht immer überschneidungsfrei möglich ist. Auch wird die mit der Kundenintegration

einhergehende Veränderung des Customer Equity, bisher in der Praxis nur unzureichend berücksichtigt und lässt sich daher in der Regel nur schwer quantifizieren. Zudem bleibt zu evaluieren, inwieweit das Modell auch über den Versicherungskontext und das betrachtete Unternehmen hinaus anwendbar ist. Bei einer Übertragung auf andere Branchen bspw. Banken sind die jeweiligen spezifischen Rahmendbedingungen zu berücksichtigen. Eine Anwendung in anderen Unternehmen erscheint zudem sinnvoll, um die hier gewonnenen Daten zu verifizieren. Zusammenfassend stellt das Entscheidungsmodell trotz des diskutierten Erweiterungspotenzials einen wichtigen ersten Schritt in Richtung einer ökonomisch fundierten Bewertung der Integration des Kunden in Geschäftsprozesse dar.

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IV Ökonomische Bewertung von Automatisierungsentscheidungen in Geschäftsprozessen

IV.1 Beitrag 5: „Economic Evaluation and Optimization of the Degree of Automation in Insurance Processes“[1]

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Zusammenfassung:

Based on insurance processes, the article analyzes automation decisions in business processes. A method to economically decide between the comparative advantages of manual and automated execution is developed. Applying criteria of value-based management to each claim, the execution that generates the optimal net present value of cash-flow is selected. Contrary to heuristic business rules this approach allows a specific control of the method of execution ex ante and during execution. Capacity restrictions are considered and thus considerations regarding resource planning and resources utility can be included.

[1] The final publication is available at http://link.springer.com. (http://link.springer.com/article/10.1007/s12599-009-0088-6)

IV.1.1 Introduction

In all industrial nations the service sector is the largest and fastest growing sector of the economy (Maglio et al. 2006, p. 82). Increasing competitive pressure in combination with technological and regulatory changes drive the transformation of business processes of service providers like insurance companies (Drew 1996. p. 23). To improve the efficiency of business processes and therefore their value proposition, process orientation is not sufficient. In fact, insurance providers need to realize a higher level of standardization, automation and flexibility in their operations and structures (Walter et al. 2007, p. 7). At the same time a flexible reaction to customer needs is essential in competition.

Banks have recognized this trend that leads not only to standardization, automation and flexibility of information technology (IT) itself (Walter et al. 2007, p. 7) but also of workflows with IT (Grob et al. 2008, p. 268): German Postbank established the "Betriebscenter für Banken" to handle a high quantity of transaction with standardized processes efficiently (Achenbach 2006, p. 210). Insurance providers are following and refer to these activities as industrialization of their processes (Uzquiano 2008, p. 14): 39% of those interviewed in Capgemini 2006 (p. 8) are pursuing actions of process optimization, standardization and automation in insurance business. Even after accomplishing business process reengineering the automated and standardized processes can potentially be optimized. This potential is rarely used like it is done in the project "Dark Process Optimization" of Postbank (Berensmann 2005, p. 277). It is the goal of this article to analyze the evaluation of the benefits of fast and cheap automated processing on the one hand and those of manual handling on the other hand (creativity and the ability to solve complex problems) from a financial perspective. The article is structured as followed: In Sect. 2 the requirements for an evaluation and optimization of service processes are identified and they are compared to approaches applied in science and industry in order to show the present gap in research. Applying a formal-deductive method (Wilde and Hess 2007, p. 282) and taking a value-based management into consideration, a model to support automation decisions in processing is developed in Sect. 3. The application is illustrated using a case study for the regulation of glass claims in Sect. 4 .Sect. 5 summarizes the implications of the model, evaluates them critically and presents further research needs.

IV.1.2 Decisions on Process Automation in Service Processes – Particularly in Insurance Processes

Insurance companies deal not only with the completion of policies and the reinsurance of parts of the taken risks but amongst others they are also occupied with the processing of various different insurance claims e.g. property or car insurance claims. Depending on the class of insurance and the policy the claim can be designed differently and will thus be processed differently, e.g. an auto insurance claim will be processed in a different way if the customer has a fully comprehensive or part insurance cover. While the claims are being processed, various actions will be performed either by the actor "human" or "machine" (Ferstl et al. 1996, p. 8). According to Ferstl and Sinz (1995, p. 209 ff) there is a differentiation between "automated systems with operations performed by machines, non-automated systems with manual operations and partially automated systems". We distinguish between entirely manually and in an exclusively automated way. Consequently there are also various degrees of automation (DA), i.e. different combinations of manually and automated processed actions.

IV.1.2.1 Requirements for a Financial Evaluation of the Degree of Automation

We are looking at insurance processes which have already been subject to Business Process Reengineering to achieve standardized and automated paths through the process. The question is now, how to determine the optimal configuration.

The optimal path through the process is usually identified by business rules that indicate which processes and resources are used to produce an artifact (Grob et al. 2008, p. 269). These rules are hardly ever uniformly specified (Schachter und Gässler 2006, p. 1), they are often not well-grounded in economical theory, they are complicated to use in dynamic environments and they make multifaceted requirements on personnel and machines (Grob et al. 2008, p. 269). The performance of processes and subsequently their optimization has to be determined using monetary and comparable measurements. An evaluation that grounds in a criterion of value-based management additionally makes it possible to calculate the value propositionof a single process to the enterprise value, which contains not only returns but also risks. We postulate:

(R1) Processes are examined future-oriented and monetarily on the basis of discounted cash flows (CF), i.e. applying the present value of future incoming and outgoing payment allows to include long-term effects like changes in customer relationships. Risk is also taken into account.

After acquisition there are only few ongoing payments for automated systems. Due to the high capacity and productivity of these systems it can be assumed that a maximum DA is targeted. However, to solve highly dynamic and complex problems the flexibility and creativity of humans is required. Exempli gratia, the absence of contact with customers that comes along with full automation of whole processes can lead to customer dissatisfaction. There are also various disadvantages of manual processing: Employees have only a limited work schedule and repetitive activities exhaust them, both of which can lead to an increasing error rate (Malitz 2007, p. 2). Since the process environment changes dynamically, it must possible to consider the choice of manual or automated processing during the realization of the process.

(R2) The method to evaluate the appropriate DA is applicable ex ante and during realization.

To select an optimal path through the process, it is essential to possess the required creativity and ability to solve problems. Lewis and Jones (1990, p. 39) suggest the following categorization: frequently occurring routine tasks, tasks with a medium degree of complexity, unplanned and unknown tasks (i.e. project activities) which do not have any references. We focus on tasks with a medium degree of complexity which depend on the specification of the process input e.g. the insurance claim.

(R3) The selection of the appropriate DA depends on the complexity of the specific process input.

Different methods of processing and a changing number of arriving process instances (e.g. peaks because of thunderstorms vs. summer depression) result in different capacity loads. In contrast to long-term capacity planning, we analyze the effects that occur when additional resources are required in manual processing or when different quantities arrive at the process.

(R4) The evaluation and optimization includes a capacity consideration, i.e. responses to changes in the number of arriving process inputs and available resources are regarded.

The selected capacity level influences the process quality and thus the quality of the service which is perceived by the customer (Adenso-Diaz 2002, p. 300). Customer-orientation is of high importance in service delivery (Lamberti 2004, p. 3) as customers show their satisfaction with the service through modifications in their future payment patterns. This has an effect on the customer and thus on the enterprise value and has to be integrated – like all payments that incur before, during and after the process realization – in the valuation.

(R5) An extensive evaluation of the process realization is carried out, i.e. all direct and indirect process-outcomes which occur currently and in future must be factored in the valuation of business processes.

All above mentioned requirements should be satisfied by an approach for the financial evaluation of the DA of insurance processes.

IV.1.2.2 Related work

Based on the presented requirements the approaches of Delpachitra (2008), Adenso-Diaz et al. (2002), Balasubramanian and Gupta (2006) and Grob et al. (2008) are compared in Tab. IV-I. Even though the discussed approaches can be applied for automated processes, only Balasubramanian and Gupta (2006) enable an ex-ante determination of the DA using metrics (e.g. activity automation factor). In literature, there is an intense discussion about the evaluation and optimization of processes using target achievement of structural metrics as process costs, cycle time and reliability (Nissen 1994; Tjaden et al. 1996; Kueng and Kawalek 1997). Nissen (2002) points out that these metrics can only be calculated ex post and are therefore not suitable for an ex ante control. Grob et al. (2008) determine the DA integrating business rules. Including capacity restrictions using business rules result in the shortcoming that the quantity of applied business rules escalates over time (Beck 2006, p. 282 and 293). Grob et al. (2008) consider capacity restrictions and different utilization ratios (cf. Tab. IV-I.).

Only the approach of Adenso-Diaz et al. (2002) enables an evaluation that incorporates all assignable results of a process instance. Costs which are independent from evaluation are regarded by Köster (2004) and Gerboth (2000) in activity-based costing as a facet of process management. Delpachitra (2008) uses activity-based costing with eight different cost categories which do not include indirectly allocable process results in combination with a process benchmarking approach. Tab. IV-I shows that none of the approaches is concerned with a method based on future oriented cash flows that are independent from evaluation - as required in (R1).

Tab. IV-I Comparison of previous work with respect to requirements

Requirements		Delpachitra (2008)	Adenso-Diaz et al. (2002)	Balasubramanian and Gupta (2005)	Grob et al. (2008)
(R1)	Future oriented and monetary evaluation based on present value cash flows	− Valuation is based on costs	− Not considered	− Not considered, metrics are essential for the valuation	− Not considered
(R2)	Evaluation of the appropriate degree of automation ex ante and during realization	− Not modeled	− Not modeled	+ Possible, e.g. via "Activity automation factor"	+ Integration into business rule is possible
(R3)	Regarding of different process inputs	+ Application is possible	− Not modeled	+ Application is possible	+ Integration into business rule is possible
(R4)	Regarding of a capacity consideration	+ Identification of overcapacities allows efficient use of resources	+ Long term resource planning	− Not considered	+ Integration into business rule is possible
(R5)	Extensive evaluation	− Not considered	+ Customer reaction via use of different levels of quality possible	− Not considered	− Not considered

Based on this measurement we develop a model for the determination of the optimal path for the process instance that supports a flexible decision even in different capacity situations.

IV.1.3 Formulating the Decision Model

Below a model that meets the requirements named in Sect. 2.1 is developed.

IV.1.3.1 Definitions and Basic Assumptions

First we will define the fundamental terms:

- A **process model** is a precise abstract illustration of a business process in a specific notation. A process consists of **actions** in a control flow which defines a sequence relationship. In the control flow there are decision nodes and merges.

Below, following to Ferstl et al. (1996, p. 26) we assume a given semiformal process model, an activity diagram of UML 2.0 (OMG 2007, p. 295ff). A formal model consisting of variables, constants and operators can be deduced from this model.

- A specific path through the process of the process from beginning to end is called path. A **path** j $(j = 1, 2, ..., J)$ is thus an explicit sequence of actions for which exactly one outgoing branch is chosen at each decision node (schema level).
- A **claim** F $(F = 1, 2, ...)$ is a single execution of a path. Hence it is a concrete instance which is consecutively processed in the actions of a path. For a process input the

optimal path through the process and thus the appropriate DA are to be identified (instance level). A claim in a path is a process instance (instance level).

- Each claim has nominal and cardinal **attributes** which allow drawing conclusions concerning the claim's properties before processing. Nominal attributes (e.g. the type of a claim or the customer group) are regarded as discrete variables and have a limited number of characteristics. The cardinal attributes (e.g. amount of loss or age of customer) are regarded as continuous and normally distributed variables. There is a database consisting of a set Ω of past claims which contains the nominal and cardinal attributes and the results of process execution (e.g. execution time (ET) and resulting CFs) for each of those claims.
- We distinguish between different types of **decision nodes**: The decision at so called functional decision nodes is already provided by the properties of the claim (e.g. it depends on the age of the car). At so called procedural decision nodes there is a decision for different methods of execution representing different levels of automation. We focus on procedural nodes.

After defining the fundamental terms for the model, we assume:

Assumption 1 (Process) *There is a semi-formal model of a loop-free process. At procedural nodes, we can decide on different methods of execution resulting in different DA.*

To consider capacity restrictions in the model (cf. (R3)) the actions are regarded independently.

Assumption 2 (Actions) *The process consists of actions a (a = 1, 2, ..., A) which are executed by resources (humans or systems). Single resources are attributed to specific actions and cannot be prorated on different actions. Each action is modeled as an M/M/1-system (Kendall notation), i.e. we assume that arrival and execution time are exponentially distributed and there is one operating unit (i.e. the action) with arrival rate λ_a for a time interval and execution rate η_a. The set of actions on path j is A_j.*

In terms of queuing system theory we regard actions as operating units which execute process instances. For this purpose available mathematical models for measuring the effects of random arrival and execution times can be consulted. We can determine the resulting stabilization in number of instances and waiting time in the system (Neumann and Morlock 2004, p. 665ff). Each action is modeled as a separate M/M/1-system. This represents

infrequent events with great risk (e.g. thunderstorms), which are typical for the insurance industry, as a Poisson-process (Bamberg und Baur 2002, S. 103) and will be of relevance in chapter 3.2.

According to (R1) the approach is aimed at integrating all results of process execution. Hence, we assume the following taking into consideration (R4) and (R5):

Assumption 3 (Cash-flow-effectiveness of in- and outgoing payments) *There are variable cash-flows for executing the process instance* $B \in]-\infty;0]$*, for direct process-outcomes* $D \in]-\infty;\infty[$ *and for indirect process-outcomes* $I \in]-\infty;\infty[$*. Fix CF are considered separately or proportionally. To take those effects which are cash-flow-effective in the long-term into consideration the cash-flows are discounted applying a common interest rate. Cash-flows are measured for a claim F which is processed in path j.*

The present value of the overall cash-flow $CF_{F,j} \in]-\infty;\infty[$ of a claim F in path j can be summarized as follows:

$$CF_{F,j} = B_{F,j} + D_{F,j} + I_{F,j}. \quad (1)$$

Assumption 3a (Cash-flow for execution of process instance in an action $B_{F,j}$) *Cash outflows* $B_{F,j}$ *occur during the execution of claim F for each action a on path j. We distinguish between manually (ma) and automatically (au) executed actions:*

For each manual executed action (binary variables $b^{ma}{}_a = 1$ *and* $b^{au}{}_a = 0$*) there are cash-outflows for resources. They are calculated using the execution time* $t_{F,a} \in [0;\infty[$ *and the wage rate* $z^{ma}{}_a \in [0;\infty[$ *of action a, which can escalate because of short-term adjustments or the need of additional resources (cf. 3.2.). Waiting times, break times and down times, which are flexibly compensated by colleagues, are already included.*

For each automatically executed action (binary variables $b^{ma}{}_a = 0$ *und* $b^{au}{}_a = 1$*) there are cash outflows for the system. These are composed of cash outflows for processing* $z^{au}{}_a \in [-\infty;0[$*, of a failure probability* $p_a \in [0;1]$ *and the resulting costs of a failure* $y_a \in [-\infty;0[$ *in action a. Automatically executed actions can also be performed by external service providers (e.g. as web services).*

Considering the cash-flow for execution in automated actions the restriction on the license model pay-per-use is justifiable (Boles and Schmees 2003, p. 385 ff), as also for other license models (e.g. time licenses, resource licenses) planning values for employment costs can be

calculated applying a pre-calculation (Braunwarth and Heinrich 2008, p. 102). These can be used as input data for the model.

In summary the sum of cash-flows for the executions of claim *F* in path *j* can be obtained as follows:

$$B_{F,j} = \sum_{a \in A_j} \left(b^{ma}{}_a \cdot \left(t_{F,a} \cdot z^{ma}{}_a \right) + b^{au}{}_a \cdot \left(z^{au}{}_a + p_a \cdot y_a \right) \right). \quad (2)$$

Alongside there are cash flows as a consequence of the execution, e.g. the customer pays for the service or the company delivers the service. They are also assignable to a specific path.

Assumption 3b (Direct process-outcomes $D_{F,j}$) *Direct process-outcomes $D_{F,j}$ are cash-flows which are linked to the execution of claim F in path j. Independent from the number of available resources and the quantity of arriving process instances the direct process-outcomes are one and the same if process instances are executed identically.*

Furthermore we consider indirect effects of the execution of a process instance. The customer perceives a certain quality and this influences her satisfaction (Matzler 2000, p. 291). In combination with other factors e.g. competitor actions and customer behavior this in turn effects customer loyalty. Only loyal customers generate returns for the company e.g. through repetitive buying (Homburg and Giering 2000, p. 61). A higher degree of customer satisfaction thus reduces the migration of customers (Oliver 1997) and increases the probability of customer recovery (Homburg et al. 2004; Maxham und Netemeyer 2003). Together with higher revenue and more frequent recommendations this leads to higher expected customer cash-flows (Krafft 1999, S. 523). Finally, it results in an alteration of the customer lifetime value. According to (R5) these expected changes are integrated in an exhaustive valuation of the process as the customer lifetime value can influence the enterprise value. Customer satisfaction can moreover change the reference potential, i.e. the number of potential customers that a customer can reach during her lifetime (Rudolf-Sipötz 2001, S.108). The result of the process execution, e.g. the fact whether and how a claim is settled, influences the customer satisfaction significantly. For claim settlement in insurance companies we distinguish between rejection and payment of a claim. In the first case, the effect on customer satisfaction depends, above all, on the claim, e.g. the rejection of a low loss amount might not be clear to the customer. The resulting decision between the potential savings because of intensive checking, which also causes costs, and the possible reduction of customer lifetime value are not focused in this approach. We consider claims that lead to the

result that is expected by the customer, e.g. settlement of the claim. The functional choice of the most appropriate process result would be an advanced decision problem o but it is not integrated in the present approach to avoid any bias in the optimization.

Assumption 3c (Indirect process-outcomes $I_{F,j}$) *Depending on the satisfaction with the result of the process execution customers will extend or reduce their relationship with the company. This leads to positive or negative changes of the customer lifetime value which are referred to as indirect process-outcomes $I_{F,j}$. $I_{F,j}$ summarizes the present value of all cash in- and outflows that can in the long-term be attributed to the customer relationship. We estimate the indirect process outcomes in dependency of the most important influencing factors: $I_{F,j} = I(DLZ_{F,j}, g, q)$. These are not only the cycle time in the process $DLZ_{F,j} \in [0;\infty[$ but also the customer group g (one of the nominal attributes) and the complexity $q \in]-\infty;\infty[$. It is not essential to know the absolute customer lifetime value but its alteration.*

In Sect. 4, we specify one of these relations and the calculation in detail.

IV.1.3.2 Optimization

Regarding a new process instance that has not been processed yet, we want to define the most appropriate DA, i.e. the path that fits best. The decision for a specific path depends on the number of available resources and the quantity of process instances that arrive at the process or are processed temporarily in the specific process.

To chose the appropriate path j for claim F functional restrictions which prohibit the execution of a claim in specific paths have to be considered. Subsequently, there is a decision for one of the remaining path j by calculating the present value of $CF_{F,j}$ which is the result of processing claim F in this path. For each claim F path $\tilde{j}_F$, which generates the maximum present value of $CF_{F,j}$ in the specific capacity load, should be chosen:

$$\tilde{j}_F = \arg\max_j \quad CF_{F,j}. \tag{3}$$

To determine this optimal path, the single components of $CF_{F,j}$ for each path j have to be calculated or at least estimated. Ex ante, the direct process-outcomes $D_{F,j}$ for a newly arriving claim F and the BZ in the action $t_{F,a}$, are neither known nor calculable but we know the characteristics of the attributes. Based on former reference claims whose nominal and cardinal attributes, direct process-outcomes $D_{F,j}$ and ET $t_{F,a}$ are known we can draw conclusions for the present claim. However, it has to be taken into consideration that past data is only limited

suitable for conclusions on future claims and thus the results are estimations. As there are various reference claims which are similar to the regarded claim we can assume, according to the central limit theorem, that the sums of $D_{F,j}$ und $t_{F,a}$ of the reference claims are normally distributed for a specific claim or specific action.

Assumption 4 (Properties of direct process-outcomes and processing times) *Direct process-outcomes $D_{F,j}$ and processing time ET $t_{F,a}$ of the actions are independent and normally distributed.*

Following, we present a method for a risk-adjusted estimation of direct process-outcomes $\widetilde{D}_{F,j}$ and processing times $\widetilde{t}_{F,a}$ in action *a* for claim *F*. A detailed description of the method can be found in the appendix.

First, some representative example claims are selected based on characteristics of known attributes. Within this set, the arithmetical average of direct process-outcomes and processing times are calculated as an estimation for the new claim. Using the standard deviation as a measurement of risk we adjust for risk using a function that takes the decision maker's attitude towards risk into account. To determine the path that delivers the maximum present value of CF, the components of CF are calculated respectively estimated.

IV.1.3.2.1. Process Execution $B_{F,j}$

The calculation of $B_{F,j}$ is based on equation (2) and will be enlarged for optimization to consider different capacity loads. For each action *a* we examine how many resources R_a are available respectively necessary to process the claims there. A change in the quantity of available resources or arriving process instances results in changes in manual processing. E.g. if all routine claims are checked by a specialist there will be a bottleneck. Similar effects on automated processing can be neglected since there are no relevant capacity restrictions because of the high performance of automated systems. Following, we present a method to obtain the resulting CF for manual processing.

1) Determine the current workload applying a M/M/1-queueing systems for each action (cf. Assumption 2):

To determine the optimal path the current workload has to be considered. A workflow management system can provide the necessary data. For the simulation of a process the amount of process instances in the system $\Lambda_a \in [0;\infty[$ must be estimated using a M/M/1-queueing system:

The arrival rate of the previous period is used as the parameter of the Poisson-distribution of the arrival rate $\lambda_a \in [0;\infty[$. The execution time $\eta_a \in [0;\infty[$ is determined according to the execution rate of the resources R_a^{Plan} which are allocated for action *a*. There is a temporal restriction $k_a \in [0;\infty[$ which represents the available time of each resource for the execution of process instances in a given time period (e.g. a day). To calculate the processing time, we revert to the average ET $\bar{t}_a$ of the action for all known process instances of path *j*:

$$\eta_a = \frac{R_a^{Plan} \cdot k_a}{\bar{t}_a}. \tag{4}$$

According to Neumann and Morlock (2004, p. 671) there are

$$\Lambda_a = \frac{\lambda_a}{\eta_a - \lambda_a} \tag{5}$$

process instances that are to be processed in the system of action *a*.

2) Period-based determination of the appropriate number of resources for action a:

As introduced in Assumption 2, resources are assigned to single actions and a proportional allocation is not possible. We need an integral number of resources $R_a \in \{1,2,...\}$ in action *a* to execute Λ_a process instances. The processing time of these process instances is the sum of ET for which we assume the average ET $\bar{t}_a$. As an additional resource has to be brought in when the capacity restriction is reached, there is a step cost structure:

$$R_a = \left\lceil \frac{\Lambda_a \cdot \bar{t}_a}{k_a} \right\rceil. \tag{6}$$

3) Determinate of the wage rate z_a^{akt} that goes along with the current workload

There are additional costs if we need supplementary short-term resources on top of the long-term planned resources R_a^{Plan} for action a in order to process the current workload. Besides the step cost structure there are costs that depend on the number of required resources R_a in each period: $S_a(R_a - R_a^{Plan})$. The more resources are needed, the higher the "penalty" for short-term adjustments and thus the current wage rate z_a^{akt}:

$$z_a^{akt} = \frac{k_a \cdot R_a \cdot z^{ma}{}_a + S_a(R_a - R_a^{Plan})}{k_a \cdot R_a}. \tag{7}$$

For each period we are therefore able to respond to variations in capacity in action *a* by changing the execution rate η_a by bringing in additional resources and accepting a penalty

payment S_a. Additional resources are only applied for one period and after that the demand is recalculated.

4) Determination of CF for the execution of a specific claim F in action a in a period

Based on the current wage rate z_a^{akt} and the above mentioned risk-adjusted estimation of ET $\tilde{t}_{F,a}$ there is a redefinition of formula (2):

$$B_{F,j} = \sum_{a \in A_j} \left(b^{ma}{}_a \cdot \left(\tilde{t}_{F,a} \cdot z_a^{akt} \right) + b^{au}{}_a \cdot \left(z_a + p_a \cdot y_a \right) \right). \quad (8)$$

IV.1.3.2.2. Direct Process-Outcomes $D_{F,j}$

In path j the risk-adjusted expected CF of the direct process-outcomes of the reference claims in a specific path $\tilde{D}_{F,j}$ can be used as an estimation of the CF of the direct process-outcomes $D_{F,j}$.

$$D_{F,j} = \tilde{D}_{F,j}. \quad (9)$$

A detailed description of the method can be found in the Appendix.

IV.1.3.2.3. Indirect Process-Outcomes $I_{F,j}$

The indirect process-outcomes of the various possible paths are not known before the process is executed and thus they have to be estimated. According to Assumption 3c, there is a relation that depends on the most important influencing factors cycle time $DLZ_{F,j}$ in path j, customer group g and the subjectively perceived complexity q. DLZ contains not only the ET but also the waiting time and can be calculated using the sum of the DLZ of all actions on path j. As above, we consider a manually executed action as a M/M/1-system with arrival rate λ_a and execution rate η_a and the know ET (beginning with the request and ending with receiving the executed process instances) $t_{F,a}$ for automatically executed actions is taken into consideration: $DLZ_{F,j} = \sum_{a \in A_j} \left(b^{ma}{}_a \cdot \left(\frac{1}{\eta_a - \lambda_a} \right) + b^{au}{}_a \cdot \left(t_{F,a} \right) \right)$.

(10)

The customer group g is one of the nominal attributes of each claim. To determine the complexity q (as expected DLZ in days) the claim is classified by reference to its attributes (e.g. type of claim or amount of loss). Based on this analysis we can identify how complex the customers perceive the execution of process instances in these classes: each customer group is

interviewed to find out how many days are expected for execution for each type of process instances. Therefore, applying the relation of Assumption 3c, there is a monetary estimation of indirect process-outcomes.

As a result of the optimization for a specific newly arriving claim F we obtain a decision for the optimal path $\tilde{j}_F$ in the moment of execution in due consideration of current capacity load on the basis of the maximum (estimated) CF of a claim.

IV.1.3.3 Process Valuation

In the following we present a cross-claim view of a process to evaluate the process configuration. Thus the quality of the conduct of a claim in respect of the DA can be measured and the improvements by applying the presented optimization can be assessed. Additionally, the aggregated key figures are a basis for control and planning of resources.

IV.1.3.3.1. Resulting Cash-Flow of an Average Process Execution $\overline{CF}$

Regarding averages as an aggregated view on a sample of process executions allows drawing uniformly valid conclusions on the performance of the process and the method to determine the DA for single process instances. Apart from problems that come along with calculating averages, the cash-flow of an average process execution is calculated as a key figure of a sample of regarded process instances.

IV.1.3.3.2. Rates of Utilization of Paths

For each claim F the appropriate DA i.e. a path j is chosen according to the approach presented in Sect. 3.2. Aggregately regarding a process, the partition in manual and automated processing is remarkable. The utilization of paths allows having resources available in the long term where the majority of process instances is processed. Hence, an uneconomic short term reallocation can be avoided. To calculate the utilization of paths, the number of process instances that are assigned to a path is divided through the total number of regarded process instances. Thus benchmarks for the workload of actions which are part of paths are determined and resources can be planned based on historical data. Purpose and application of these key figures are made clear in the following case study.

IV.1.4 Case Study

Hereinafter, the model presented in Sect. 3 is applied using the example of an insurance company. The examined process of handling own damage glass claims is executed in the back-office of insurance providers without direct customer contact. But there remains the possibility that the perceived service quality influences customer satisfaction.

In Abb. VI-1 the regarded section of the process is simplified. After recording the data of the claim in the action "classification and extraction" there is an either manual or automated acquisition of the claim. The calculation of the customer payment goes along with these process steps. After that an expert can determine whether a reduction of the claim amount is applicable by emans of a manual check. As an alternative, an automated report can be generated followed by an automated checking and will then be automatically processed further. Finally, there is a manual or automated payment and closure of the claim. Thus, there are twelve different paths.

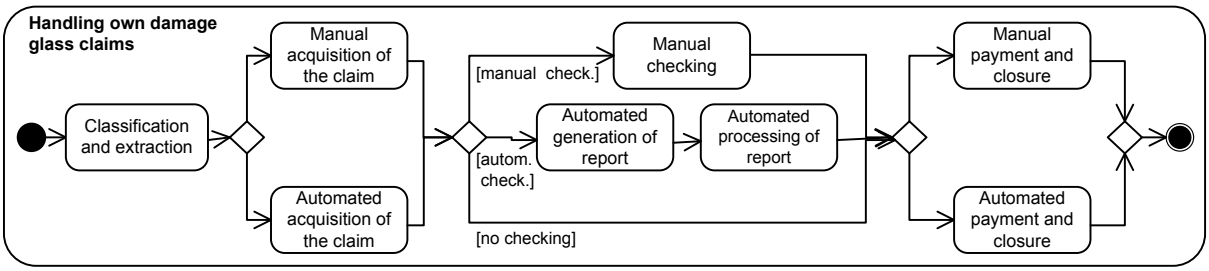


Abb. IV-1 Regarded process with different DA

The data for the application of the model is derived from an industry project and is modified for the purpose of anonymization. In total approx. 4,000 claims are processed in the regarded workflow – three of them are shown in Tab. IV-3. From the record we know the discrete attributes like type of claim and customer group and the cardinal attributes like amount of loss and the age of the vehicle.

The claims are executed in a specific path of the process and thus in specific manually or automatically executed actions for which specific data must be renowned. A certain number of resources is assigned for each action (e.g. for action "manual checking" there are two resources with eight hours per day each; per resource and day there are costs of 466.66 €). If additional resources are required the associated costs S_a are calculated as follows with R_a being the total number of required resources: $S_a(R_a) = 66{,}67 \cdot e^{(R_a - 2)}$.

To determine the direct process-outcomes and ET of a claim, here we draw on 10,000 reference claims. The data of the reference claims is stored in a company-wide repository

which contains not only transaction data but also historical data. This is relevant to the determination of indirect process-outcomes: By analyzing the reference claims in the repository with respect to the effects of one claim on the customer value and portfolio of policies and by interviewing customers, a coherence between the realized *DLZ*, the expected execution time *q* (each measured in days) and the indirect process-outcomes *I* can be deduced, e.g. $I(DLZ,Standard\ customer,q) = 5{,}2778 \cdot (DLZ - q)^3 - 4{,}8701\ (DLZ - q)^2 + 8{,}0556\ (DLZ - q)$. Tab. IV-2 shows an overview of the necessary data for the model and some exemplary sources of information.

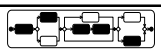
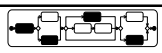
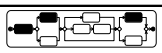
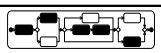
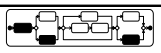
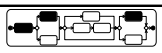
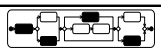
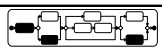
The execution of the process is analyzed from two different perspectives. An average day is compared to straight automated respectively manual execution and to the outcomes that result from either an application of business rules or from the application of the optimization approach presented in Sect. 3.

Tab. IV-2 Data-oriented requirements for the application of the model and each source of information in the case study

Data that is necessary for application		**unit**	**Source of information**
Process data			
Wage rates of the resources for the actions	z_a	€/day	Figures of controlling about costs of employees (for external actions outflows for the system, for automated additionally probability and costs of a failure)
Amount of long term planned resources	R_a^{Plan}	-	Determined during planning
Outflows for short-term adjustments of resources	$S_a(R_a)$	€	Overtime regulations, internal calculation for replanning of employees
Claims in general			
Nominal attributes (e.g. type of damage, customer group)			Documents of the claim are digitalized during data extraction
Cardinal attributes (e.g. amout of damage, age of the car)			
Reference claims			
Direct process-outcomes	$D_{F,j}$	€	Are available within the database as a result of the execution of the reference claims; are related to the path, in which the reference claim was executed
Execution time for each action	$t_{F,a}$	hour	
Tolerated distance for reference claims	ε	-	Likely to the distances within the database, set by the insurance company. For the case: ε=1
Risk attitude of the decision maker	α	1/€ 1/days	Calibration by using the situation, in which the decider is indifferent between risk and a specific result (Bamberg 1981, S.212). For the case: for direct process-outcomes α=0,00128 1/€, for times α=236,2 1/days
Indirect process outcomes			
Relation between cycle time, customer group and complexity	$I_{F,j}$	€	$I(DLZ_{F,j}, g, q)$ is estimated i.e. by customer questionnaires and experience
Complexity of a claim	q	days	Estimation of the expected cycle times by the customer as a measure for complexity
Utilization data			
Temporal restriction of a resource	k_a	hours/ day	Work contracts and experience of controlling, contract work times minus preparation times
Arrival rate of previous period	λ_a	amout/ day	Continuous monitoring per action

Tab. IV-3 illustrates the chosen paths for three selected claims and the resulting CFs. Claim C is a standard claim which should be executed automatically (the path schemas in Tab. IV-3 relate to picture 1 – used actions are marked in black). Nevertheless there is a variety of claims for which neither of the extremes is appropriate (cf. claim A and B). This can be seen in the comparison of average CFs of all claims of a day in Tab. IV-4. It is remarkable, that manual processing leads to increased costs but reduces customer satisfaction (payments of indirect process-outcomes show this effect). In contrast, automated execution leads to an improved customer satisfaction because of fast processing.[2]

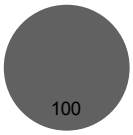
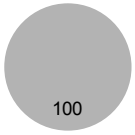
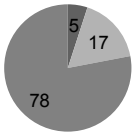
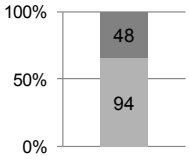
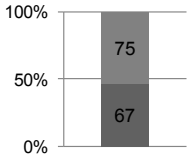
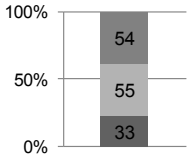
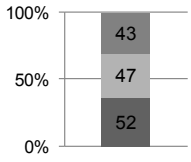
Tab. IV-3 Comparison of different method for choosing the appropriate DA for example claims (selected execution is marked)

Claim	Description		Only automated	Only manual	Business Rules	Optimization
A	Install new windscreen into upper class car, damage 801,63 €	Path				
		CF	-718,42 €	-637,17 €	-672,56 €	-547,62 €
B	Install new windscreen into middle class car, damage 901,23 €	Path				
		CF	-712,56 €	-802,33 €	-716,98 €	-679,28
C	Repair wind-screen in small car, damage 243,91 €	Path				
		CF	-62,84 €	-289,65 €	-200,22 €	-62,84 €

The presented approach for process control suggests e.g. substituting the automated checking by manually checking for claim A which results in a significant improvement of the CF (Tab. IV-3). On average, the increased flexibility of the optimization model is reflected in savings. Compared to business rules, the payments for process execution and the insurance benefits can be reduced and the customer satisfaction can be improved (Tab. IV-4). This improvement is a result of the selection of the appropriate DA for each claim.

[2] This effect does not occur if there is a direct settlement between repair shop and insurance provider which is common for glass repairs.

Tab. IV-4 Comparison of different methods for choosing the DA for an average day

142 Claims (1 day)		Only automated	Only manual	Business rules	Optimization
% only automated % only automated % combined					
no checking automated checking manual checking					
Overall Cashflow	EW	-509,69 €	-452,17 €	-397,99 €	-369,82 €
	σ	270,40 €	285,71 €	298,82 €	307,71 €
CF Process execution	EW	-22,57 €	-25,23 €	-22,84 €	-15,69 €
	σ	9,73 €	15,68 €	14,39 €	7,51 €
CF direct process-outcome (insurance benefit)	EW	-499,04 €	-397,18 €	-431,17 €	-426,60 €
	σ	260,18 €	274,52 €	254,72 €	262,11 €
CF indirect process-outcome	EW	11,93 €	-29,76 €	56,02 €	72,47 €
	σ	106,36 €	59,50 €	119,68 €	118,25 €

Now we analyze the ability of the model to be responsive to changes in the quantity of arriving claims and the thus resulting consequences. Due to the fact that each day a different volume of claims arrives, there are various load situations. Extraordinary high load occurs e.g. after thunderstorms when a lot of customers report their claims. Abb. IV-2 shows the number of daily arriving claims, the average CF of a claim per day and the partition on different paths (cf. Sect. 3.3) for 20 workdays of a month. However there is a simplification: We only regard the automation decision for checking because this decision influences the result most significantly.

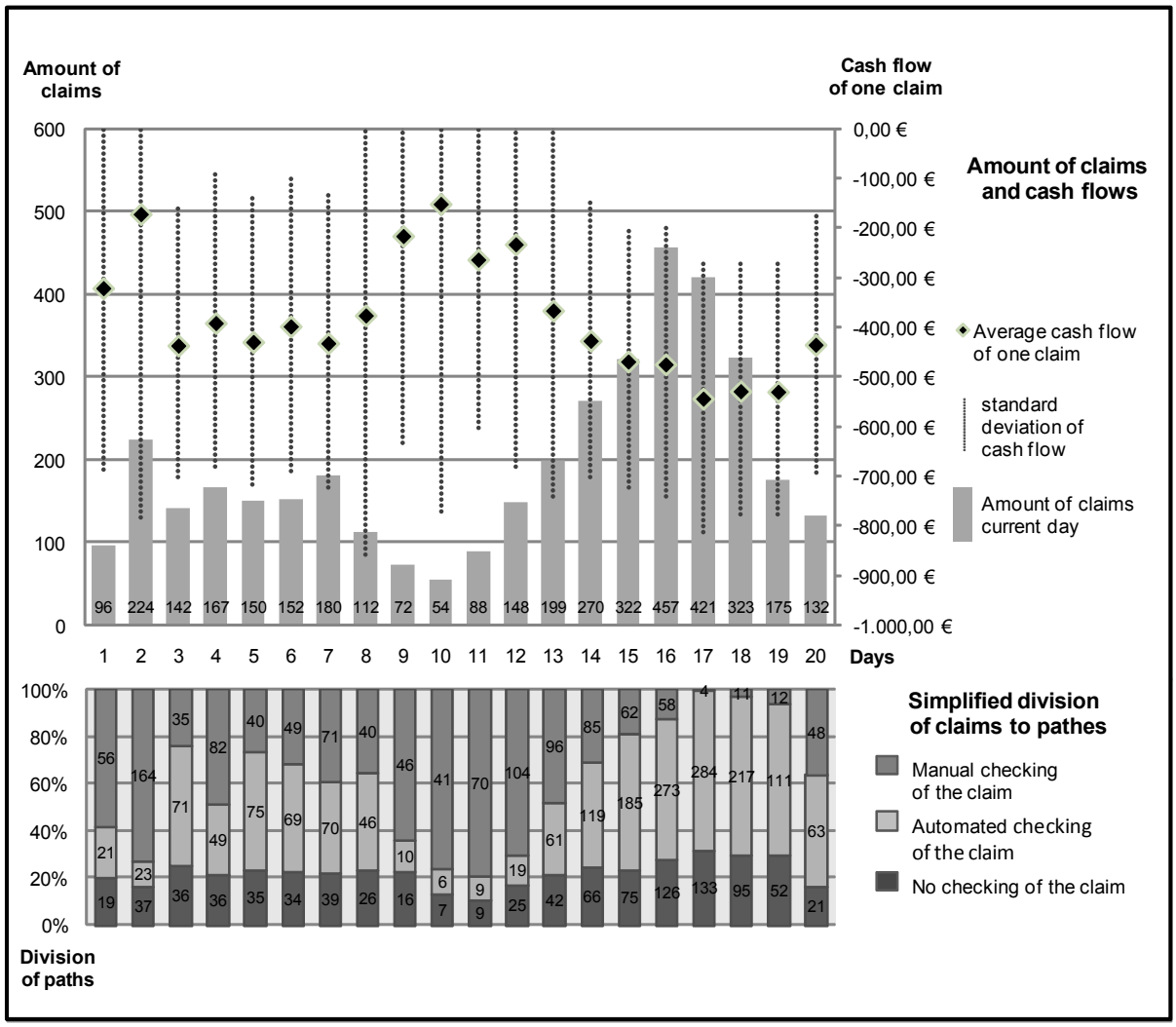


Abb. IV-2 Analysis of a month with 20 workdays

There are two different effects regarding the selection of an appropriate method of execution: First, different quantities of claims arrive and due to capacity restrictions different methods of processing are preferred. Second, because of different properties of the claims different DA are appropriate. This explains the changes in partitions of paths on days with similar load (e.g. 4 and 5). On quiet days (e.g. 9 to 11) the share of manual checking is increased to use the free capacity of the agents. Simultaneously, the standard deviation of the CFs increases (e.g. compare day 10 to day 16) because the manual processing implies greater variations. The daily results are mostly based on the load of the previous day which is the estimation of the expected demand. Thus, changes in demand only become effective in the subsequent period, e.g. decreased demand on day 8 will become effective on day 9. In high load situations (day 14 to 18) systems absorb the increased effort but the payments per claim only increase moderately.

For this case study only the number of arriving claims is variable and the resources are regarded as constant. But this is equivalent to a vice-versa approach and a day with increased appearance is comparable to vacation time when only a few agents are available.

Hence, for back office processes of insurance companies the DA that generates the optimal present value of CF can be selected. Thus, the presented approach fulfills (R1) to (R5) and enables a financial valuation and optimization.

IV.1.5 Summary and Conclusion

In this article we presented a model that supports automation decisions in insurance processes on the basis of maximum present values of CF. For this, amongst others, reference claims are identified from historical data and cash-flows are extrapolated from this data for the current claim. Constitutively, a method for evaluation and optimization of the degree of automation of these processes is suggested and the application is illustrated using a case study. We also present how risks and capacity restrictions influence the decision for manual or automated execution.

The presented approach has some advantages:

(1) Comparative advantages of manual and automated execution can be compared. As in the case study neither manual processing (average CF: *-452,17 €*) nor automated execution (average CF: *-509,69 €*) is optimal but a financially oriented selection of the DA as the model proposes (average CF: *-369,82 €*). The model thus supports the statements that purely automated processing of whole processes and the corresponding reduction of jobs and the dependency on automated execution are of financial disadvantage.

(2) Furthermore, the approach allows an application ex ante and during the execution as no inflexible heuristic rules are used. The optimal manner of processing rather depends on the current work load: In the case study the model suggests manual checking in 80% of all claims if there is capacity underload, but if there is extraordinary high load only 5% are checked manually. Despite the high degree of flexibility a standardized and automated execution is possible. Moreover, the presented approach allows drawing conclusions on how many resources should be provided to enable frictionless execution in extreme situations.

The presented approach currently focuses on service processes without direct customer contact where the performance of existing contractual duties is central. To apply the approach, a process that fulfills these limitations and the assumptions of the model is required. Furthermore, the required data (cf. Tab. IV-2) needs to be available or appreciable. We aim to render services with a minimum of required payments. It is of peculiar interest to analyze the behavior of the model in value generating processes e.g. in sales where direct and indirect process-outcomes lead to revenues and thus there are changed prerequisites. Now we focus on insurances – a further starting point is the adaption to specific requirements of service processes of other industries.

IV.2 Appendix

Table of Variables

	Variable	Description
Calculation of cash flows	$j=1,\ldots, J$	Paths in the process
	$a=1,\ldots,A$	Actions on a path
	A_j	Set of actions on path j
	F	Claim
	$CF_{F,j}$	Overall cash flow of claim F on path j
	$B_{F,j}$	Cash flow for execution
	$b^{ma}{}_a$, $b^{au}{}_a$	Binary variables, which indicate the type of an action a
	$t_{F,a}$	Execution time for action a
	$z^{ma}{}_a$	Manual wage rate for action a
	$z^{au}{}_a$	Cash outflow for automated processing of action a
	p_a	Failure probability (system) in action a
	y_a	Cash outflows in the case of a system failure in action a
	$D_{F,j}$	Cash flow for direct process-outcomes
	$I_{F,j}$	Cash flow for indirect process-outcomes
	$DLZ_{F,j}$	Cycle time of claim F on path j
	g	Customer group
	q	Complexity of a claim
Optimization, Calculation of resources	$\tilde{j}_F$	Best path for claim F
	$\hat{t}_{F,a}$	Certainty equivalent cycle time
	$\hat{D}_{F,j}$	Certainty equivalent direct process-outcomes
	λ_a	Arrival rate for action a
	η_a	Execution rate for action a
	R_a	Number for necessary resources for action a
	k_a	Temporal restriction of a resource for action a
	$\bar{t}_a$	Average processing time of a claim for action a (within the database)

	Λ_a	Number of claims that are processed in the system of action *a*
	$S_a(R_a)$	Function, penalty for additional resources depending on the amount
Additional variables for the appendix	$n=1,...,N$	Nominal attributes of a claim
	Ω	Set of claims within the database
	$\Omega_{F,j}$	Set of claims within the database with corresponding path and nominal attributes
	$\Psi_{F,j}$	Reference set for claim *F* on path *j*
	μ_n, σ_n	Expected value and standard deviation of attribute *n*
	$(f_1,...,f_N)$	Attributes of a claim
	$\dot{F}^1$	Claim with standardized attributes
	$d(F^1,F^2)$	Distance between two claims
	$\mu^t_{F,a}$	Expected value for the execution time of action *a* within the reference set for claim *F*
	$\mu^D_{F,j}$	Expected value of direct process-outcomes D_j within the reference set for claim *F*
	$\sigma^t_{F,a}$	Standard deviation of execution time of action *a* within the reference set for claim *F*
	$\sigma^D_{F,j}$	Standard deviation of direct process-outcomes D_j within the reference set for claim *F*
	α	Risk attitude of the decision maker
	$\Phi(\mu,\sigma)$	Preference function

Detailed description of a method for a risk-adjusted estimation of direct process-outcomes and execution time based on reference claims

For a new claim direct process-outcomes and execution time are unknown ex ante and thus, they need to be estimated. An overview of the method can be found in chapter IV.1.3.2 of the article and the detailed technique is described here.

To take the decision maker's attitude towards risk into consideration when deciding upon the optimal path for a new claim, a function of preference is applied. Selection criteria for the function of preference are the compatibility with the Bernoulli principle (Bamberg and Coenenberg 2006, p. 85ff.), the economic plausibility and the possibility to determine a deterministic certainty equivalent which is equivalent to the specific stochastic decision-making situation.

Assumption 5: *Selection of an appropriate function of preference*

An appropriate function of preference takes the expected value μ, the standard deviation σ^2 and the decision maker's attitude towards risk α into account. To ensure compatibility with the Bernoulli-principle, we draw on the (μ,σ)-principle and apply the following function of preference: $\Phi(\mu,\sigma) = \mu - \frac{\alpha}{2}\sigma^2$.

There are three steps to be executed: After selecting the reference claims, the two measurements mentioned are estimated. After that the inherent risk is integrated in the calculation. There is insecurity because even though frequently occurring claims have almost similar attributes the process outcomes can be different and there are variations. The reference claims are similar claims which can be different from the regarded claim and thus they can be wrongly estimated.

Step 1: Determination of reference claims

Of all past claims Ω those claims that were executed on the regarded path *j* and whose nominal attributes match with the new claim *F* are selected first. This ensures that only functional suitable references are selected, e.g. all claims "change of rear window" for basic customers which were automatically executed are selected.

Summarized, the determination of reference claims with this quantity based on cardinal attributes is as follows: The cardinal attributes are assumed to be normally distributed (cf. IV.1.3.1) and are comparable because of normalization. As reference claims $\Psi_{F,j}$ those past

claims are selected whose distance (which is averaged over the distance of all cardinal attributes) is smaller than a tolerance distance $\varepsilon \in [0; \infty[$. For ε e.g. the average distance of all past claims can be applied. Hence, only comparable past claims are selected and small deviation in the cardinal attributes are accepted. E.g. only those past claims are selected whose amount of loss and age of vehicle deviate only slightly from the new claim. If there are none or not enough reference claims for a new claim an alternative method which is described later has to be applied.

To determine the reference claims of a claim F in path j two steps are necessary:

a) Determining the functionally relevant claims $\Omega_{F,j}$ of all claims in the database Ω based on the nominal attributes

In step a) all claims in the database Ω are selected whose values of the nominal attributes are in full accordance with those of the new claim F and which were executed in path j. The damage category of a claim and the vehicle type are nominal attributes. If the new claim is "change of rear window" and the car-type "middle class" then all claims of the database for which these criteria are appropriate are selected. We assume that there are only these two attributes. The selection of functionally relevant claims $\Omega_{F,j}$ ensures that only functional identical claims are considered for further calculation. The further calculation is based on a limited amount of claims.

The number and value range of the applied nominal (discrete) attributes must represent the heterogeneity of the executed types of input data. But if there is a great number of nominal attributes the database will be divided in a lot of partitions. Thus, $\Omega_{F,j}$ is relatively small and identifying reference claims based on cardinal attributes is then quite limited. Particularly in the case of a small data base both, too many attributes and too many instances of attributes divide the data in small and insignificant partitions.

b) Selection of reference claims $\Psi_{F,j}$ based on cardinal attributes within the functionally relevant claims $\Omega_{F,j}$.

In step b) the actual reference claims are selected by a similarity analysis for the cardinal attributes n $(n = 1, 2, ..., N)$. For this reason the distances between the new claim F and those claims that were selected for $\Omega_{F,j}$ in the previous step are determined. All claims, whose distance is smaller than a tolerance distance ε, which needs to be defined, are selected. The definition of ε determines how many reference claims are selected. Hence, ε is to be defined so that a significant number of comparable claims is available for the calculation. E.g. the

average distance (calculation as below) between two claims in Ω or any other value which results in an appropriate selection of reference claims can be chosen for ε.

To determine the distance between two claims $F^1 = \left(f_1^1, f_2^1, ..., f_N^1\right)$ and $F^2 = \left(f_1^2, f_2^2, ..., f_N^2\right)$ the attributes n are standardized by empirical means μ_n and empirical standard deviations σ_n (Bamberg and Baur 2002, p. 109). The standardized claims $\dot{F}^1$ and $\dot{F}^2$ with equal weight for every attribute are obtained as follows:

$$\dot{F}^1 = \left(\frac{f_1^1 - \mu_1}{\sigma_1}, \frac{f_2^1 - \mu_2}{\sigma_2}, ..., \frac{f_N^1 - \mu_N}{\sigma_N} \right); \quad \dot{F}^2 = \left(\frac{f_1^2 - \mu_1}{\sigma_1}, \frac{f_2^2 - \mu_2}{\sigma_2}, ..., \frac{f_N^2 - \mu_N}{\sigma_N} \right). \tag{1}$$

The total distance between the claims F^1 and F^2 can be calculated as the euclidical distance between the claims with standardized attributes $\dot{F}^1$ and $\dot{F}^2$:

$$d(F^1, F^2) = \left| \dot{F}^1 - \dot{F}^2 \right| = \sqrt{\sum_{n=1}^{N} \left(\frac{f_n^1 - \mu_n}{\sigma_n} - \frac{f_n^2 - \mu_n}{\sigma_n} \right)^2} = \sqrt{\sum_{n=1}^{N} \left(\frac{f_n^1 - f_n^2}{\sigma_n} \right)^2}. \tag{2}$$

Within the selected $\Omega_{F,j}$ the reference claims $\Psi_{F,j}$ for path j are determined by selecting only those past claims F^{Ω} whose distance to the new claim F is smaller than the threshold ε:

$$\Psi_{F,j} := \left\{ F^{\Omega} \in \Omega_{F,j}; d(F, F^{\Omega}) = \sqrt{\sum_{n=1}^{N} \left(\frac{f_n - f^{\Omega}{}_n}{\sigma_n} \right)^2} < \varepsilon \right\}. \tag{3}$$

In summary, the reference claims $\Psi_{F,j}$ for the execution of claim F in path j are selected based on the nominal and cardinal attributes of a new claim F within the past claims Ω. Based on known and stored results of the execution of those similar claims we estimated the unknown values of claim F which are required for further calculation.

Step 2: Estimation of execution times and direct process-outcomes

Each claim of the reference claims $\Psi_{F,j}$ was executed in path j and therefore the values for the ET $t_{F,a}$ in the actions a and the direct process-outcomes $D_{F,j}$, which result from the execution are known. As a risk-neutral estimation of the ET of claim F in action a the arithmetic mean $\mu_{F,a}^t$ of the ET of the reference claims in action a can be applied. The calculation of the ET for all other actions on path j is the same. Respectively, the arithmetical mean $\mu_{F,j}^D$ of the direct process-outcomes is the risk-neutral estimation of the direct process-outcomes of claim F in path j.

Furthermore, the standard deviation of the characteristics of the reference claims $\Psi_{F,j}$ is determined as a measurement of risk: $\sigma^t_{F,a}$ is the standard deviation of the execution time of action a, $\sigma^D_{F,j}$ is the standard deviation of the direct process-outcomes in path j. They measure the variation around the means and express the inherent risk of the estimation.

Step 3: Risk valuation by the means of a function of perference

To apply the values for ET $t_{F,a}$ and the direct process-outcomes $D_{F,j}$ the above mentioned risk needs to be considered. The significance of risk in the calculation depends on the decision maker's attitude towards risk $\alpha \in]-\infty;\infty[$, which is equal to the Arrow-Pratt-Measurement (Bamberg and Coenenberg 2006, p. 97). For a risk-averse decision maker it is $\alpha > 0$ and for a venturesome decision maker it is $\alpha = 0$.

As ET and direct process-outcomes are normally distributed (cf. Assumption 4), the function of preference mentioned in assumption 5, which is compatible with the Bernoulli-principle (Schneeweiß 1967, p. 119ff.), can be applied. We must differentiate between the direct process-outcomes $D_{F,j}$ which are to be maximized and the ET $t_{F,a}$ which are to be minimized. If $\alpha > 0$, in the first case there is a deduction for risk and for the ET we need a risk surcharge to include the risk correctly into the calculation (cf. signs in equations 14 and 15). The result is the certainty equivalent with respect to the CARA-class (constant absolute risk aversion) of exponential Bernoulli utility functions (Bamberg and Coenenberg 2006, p. 108). Therefore, the combination of expected value and standard deviation can be replaced with the deterministic value Φ. It has to be considered that α gets a dimension in the course of the calculation which will be either 1/monetary unit or 1/time unit (Huther 2003, p. 153ff).

Thus, expected value and standard deviation of ET can be summarized as the risk-adjusted estimation $\widetilde{t}_{F,a}$ of actions a for claim F:

$$\widetilde{t}_{F,a} = \mu^t_{F,a} + \frac{\alpha}{2}\sigma^{t\ 2}_{F,a} \quad \forall \text{actions } a \text{ on path } j. \tag{4}$$

The risk-adjusted estimation of the direct process-outcomes $\widetilde{D}_{F,j}$ on path j is determined analog:

$$\widetilde{D}_{F,j} = \mu^D_{F,j} - \frac{\alpha}{2}\sigma^{D\ 2}_{F,j}. \tag{5}$$

The results are used for the calculation of the determination of an optimal path in chapter IV.1.3.2 of the article.

Alternative method to estimate the direct process-outcomes $D_{F,j}$ and execution times $t_{F,a}$ if there are no reference claims

If there are new claims which have not yet been executed in any path of the process, there will be no possibility to determine the reference claims and thus to estimate the direct process-outcomes $D_{F,j}$ and the ET $t_{F,a}$ of a claim F in this path. It is then examined whether technical reasons e.g. a missing functionality of the system are in opposition of an (partially) automated execution. If that is true, the specific path will not be considered for optimization. Furthermore functional restrictions which speak against an automated execution need to be considered, e.g. an automated execution of an unique claim is not reasonable.

If a claim can be executed in a specific path but the results cannot be estimated because of missing reference claims, the estimation of ET and direct process-outcomes needs to be done alternatively. Instead of applying reference claims, the heretofore best execution is applied for all possible paths. This purposeful positive estimation of the values and therefore of the cash-flows allows the integration of all potential paths and avoids that all unknown claims are manually executed. The path which generates the maximum cash flow is to be selected and the result of the process execution – not the estimation – of the new claim needs to be stored in the database. Hence, we created a reference for a new claim which can be used if the claim occurs repeatedly. Consequently, we increased the expressiveness of the database.

IV.3 Literatur

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V Fazit und Ausblick

Dieses Kapitel beinhaltet neben einer Zusammenfassung der wesentlichen Erkenntnisse der Dissertationsschrift in Abschnitt V.1 die Darstellung der Limitationen und Anknüpfungspunkte für weiteren Forschungsbedarf in Abschnitt V.2.

V.1 Fazit

Das Ziel dieser Dissertationsschrift war es, ausgewählte Aspekte der Nachhaltigkeit und der Prozessgestaltung im CRM zu beleuchten. Zunächst wurden in Kapitel I der Forschungsrahmen aufgezeigt sowie die dieser Dissertationsschrift zugrundeliegenden Beiträge in diesen eingeordnet und kurz motiviert. Anschließend griff Kapitel II Nachhaltigkeitsaspekte bei Transformationsentscheidungen und im Customer Relationship Management auf. Kapitel III widmete sich der Vorstellung verschiedener Aspekte der Integration von Kunden in Geschäftsprozesse. Hierbei wurden zunächst die verschiedenen Kundenrollen und innovative Konzepte zur Umsetzung der Kundenintegration im Finanzdienstleistungsbereich analysiert. Daran anschließend wurde die ökonomische Bewertung der Kundenintegration thematisiert. In Kapitel IV wurde abschließend die Ermittlung des optimalen Automatisierungsgrads für Prozessaktionen und die damit verbundenen Auswirkungen auf die Kunden thematisiert.

Die zentralen Ergebnisse der Dissertationsschrift werden nachfolgend noch einmal kapitelweise zusammengefasst:

- Kapitel II verfolgte das Ziel, zu analysieren, wie die verschiedenen okonomischen, sozialen und ökologischen Ziele der Nachhaltigkeit in unternehmerischen Entscheidungen berücksichtigt werden können.
  Hierzu wurde in Beitrag 1 in einem ersten Schritt ein Konzept entwickelt, anhand dessen die verschiedenen Handlungsfelder entlang der Wertschöpfungskette eines Unternehmens über die verschiedenen Dimensionen der Nachhaltigkeit identifiziert werden können (Z. II.1). Da das vorgestellte Konzept auf den Grundgedanken von (Nachhaltigkeits-) Reifegradmodellen basiert, ist es zudem möglich, den Fortschritt der Nachhaltigkeitstransformation in den einzelnen Handlungsfeldern differenziert zu betrachten. Darüber hinaus wurde im Beitrag ein Entscheidungsmodell entwickelt, das es ermöglicht, die ökonomischen Auswirkungen von Transformationsentscheidungen im Nachhaltigkeitskontext zu berücksichtigen (Z. II.2). Anhand des vorgestellten

Entscheidungsmodells kann die unter ökonomischen Gesichtspunkten anzustrebende Verbesserung von Nachhaltigkeitsreifegraden in jedem identifizierten Handlungsfeld bestimmt werden. Dies ist von Interesse, da die ökonomischen Konsequenzen einzelner Nachhaltigkeitsmaßnahmen – insbesondere in der sozialen Dimension – schwierig zu quantifizieren sind und daher häufig vernachlässigt werden. Ein Fallbeispiel eines mittelständischen Unternehmens diente zur Illustration der Anwendbarkeit des Modells sowie zur Darstellung der im Zuge der Anwendung dieses Modells auftretenden Effekte (Z. II.3). Insgesamt verdeutlichte diese Illustration, dass es für Unternehmen bei der Bewertung von Transformationsentscheidungen im Nachhaltigkeitskontext im Allgemeinen und bei der Bewertung von einzelnen Nachhaltigkeitsmaßnahmen im Speziellen essentiell ist, alle ökonomischen, sozialen und ökologischen Auswirkungen strukturiert zu erfassen und zu berücksichtigen.

Beitrag 2 widmete sich dem nachhaltigkeitsorientierten CRM. Die verschiedenen Aspekte des Kundenbeziehungsmanagement stellen ebenso wie die Beschäftigung mit der nachhaltigen Entwicklung schon seit längerer Zeit wichtige Forschungsgegenstände in verschiedenen Forschungsdisziplinen dar. Eine integrierte Betrachtung dieser beiden Themenkomplexe wird allerdings nur selten vorgenommen. In Beitrag 2 wurde vor diesem Hintergrund der Begriff des nachhaltigkeitsorientierten CRM definiert und eine Abgrenzung von ähnlichen Begrifflichkeiten vorgenommen (Z. II.4). Zudem wurde der aktuelle Forschungsstand im Hinblick auf die spezifischen Ausgestaltungen des nachhaltigkeitsorientierten CRM in den Kernbereichen Marketing, Sales und Services analysiert (Z. II.5). Die Analyse kam zum dem Ergebnis, dass sich die Kernbereiche deutlich unterscheiden und hauptsächlich in der Marketing-Literatur eine integrierte Betrachtung von nachhaltigkeits- und kundenorientierten Themen vorgenommen wird. Zudem ist eine überproportional ausführliche Betrachtung der ökologischen Dimension in der Literatur zu betrachten. Auf Basis der Analyse des aktuellen Forschungsstands wurden zudem zukünftig mögliche Forschungsschwerpunkte des nachhaltigkeitsorientierten CRM abgeleitet (Z. II.6). Dies unterstreicht die Notwendigkeit, sich auch weiterhin mit diesem interdisziplinären Forschungsfeld auseinanderzusetzen.

- Ziel von Kapitel III war es, die in der Praxis immer häufiger auftretende Kundenintegration in Geschäftsprozesse zu beleuchten. Kunden wandeln sich im

Rahmen dieser Entwicklung immer mehr vom passiven Leistungsempfänger zum aktiven Aufgabenträger.

Es gibt eine Vielzahl von innovativen Geschäftsmodellen, die auf dem Konzept der Kundenintegration basieren. Beitrag 3 stellt einige dieser Konzepte von Finanzdienstleistungsunternehmen vor (Z. III.1). Damit Kunden in die Geschäftsprozesse eingebunden werden können und Aufgaben übernehmen können, die bisher im Tätigkeitsbereich von Unternehmensmitarbeitern lagen, sind nicht nur organisationale Veränderungen an den prozessualen Abläufen notwendig, auch die Rollen der Kunden im Prozess verändern sich. Diese Veränderungen gilt es zu analysieren und die damit einhergehenden Chancen und Risiken sollten bei der Umsetzung von Kundenintegrationsmaßnahmen berücksichtigt werden (Z. III.2).

In diesem Zusammen wurde in Beitrag 4 ein quantitatives Entscheidungsmodell zur ökonomischen Bewertung der Kundenintegration in Geschäftsprozesse entwickelt (Z. III.3). Dies ist von Bedeutung, da bei der Kundenintegration oftmals unklar bleibt, mit welchen ökonomischen Auswirkungen diese für ein Unternehmen verbunden ist. Zudem werden bislang mit der Kundenintegration verbundene Investitionsentscheidungen meist aus Sicht des Kundenbeziehungsmanagements oder aus Sicht des Prozessmanagements getroffen. Eine integrierte Betrachtung findet nur unzureichend statt. Das vorgestellte Entscheidungsmodell bewertet einerseits die ökonomischen Auswirkungen und fokussiert andererseits die zunehmend erforderliche integrierte Betrachtung von Prozess- und Kundenperspektive. Das Modell soll Entscheidungsträger dabei unterstützen, diejenigen Prozessschritte eines Unternehmens zu identifizieren, in die der Kunde unter ökonomischen Gesichtspunkten als Aufgabenträger integriert werden sollte. Die praktische Anwendung des Modells wurde am Beispiel eines international tätigen Versicherungsunternehmens veranschaulicht (Z. III.4).

- Der Fokus in Kapitel IV lag auf der Betrachtung von Automatisierung und Flexibilisierung als zwei der wesentlichen Kennzeichen der Industrialisierung von Dienstleistungsprozessen. So wurde ein Modell zur Unterstützung wertorientierter Automatisierungsentscheidungen in Versicherungsprozessen vorgestellt (Z. IV.1). Darauf aufbauend wurden Verfahren zur Bewertung und Optimierung dieser Prozesse vorgeschlagen und ihre Anwendung an einem Praxisbeispiel illustriert. Es wurde auch dargestellt, wie neben Risiken auch Kapazitätsrestriktionen die Entscheidung zwischen

manueller und automatischer Bearbeitung beeinflussen. Weiterhin lassen sich mit diesem Ansatz die komparativen Vorteile von manueller und maschineller Bearbeitung vergleichen (Z. IV.2). So stützt das Modell die Aussage, dass die rein automatische Bearbeitung ganzer Prozesse und damit evtl. verbundener geplanter Stellenabbau sowie völlige Abhängigkeit von maschineller Verarbeitung ökonomisch nicht sinnvoll sind. Außerdem ermöglicht das Modell eine flexible Betrachtung ex ante und zur Laufzeit, da keine starren heuristischen Regeln zur Anwendung kommen, wie heute häufig in der Praxis üblich. Die optimale Bearbeitungsweise ist vielmehr abhängig von der jeweils aktuellen Auslastung und der Wirkung des gewählten Automatisierungsgrads auf den Kunden. Trotz hoher Flexibilität ist eine standardisierte und automatisierte Bearbeitung sowie eine dynamische wertorientierte Gestaltung möglich.

V.2 Ausblick

Im Folgenden werden ausgehend von den Limitationen der in dieser Dissertationsschrift enthaltenen Beiträge weiterführende Fragestellungen aufgeworfen, welche künftigen Forschungsbedarf im Hinblick auf Nachhaltigkeit und Prozessgestaltung im CRM darstellen.

Kapitel II stellt grundlegende Nachhaltigkeitsaspekte bei Transformationsentscheidungen und im Customer Relationship Management vor. In diesem Zusammenhang bestehen einige Ansatzpunkte für künftige Forschung:

- In Beitrag 1 wird das Konzept des *Sustainability Maturity Cube*, der Unternehmen bei der Strukturierung von Nachhaltigkeitsentscheidungen unterstützt, vorgestellt und detailliert auf dessen Herleitung eingegangen. Bei der Anwendung des Cubes ist lediglich die Operationalisierung der Perspektive *Dimensions of Sustainability* durch die „Drei Säulen der Nachhaltigkeit“ vorgegeben. In Beitrag 1 werden Porter’s Wertschöpfungskette und Nachhaltigkeitsreifegradmodelle zur Operationalisierung der beiden weiteren Perspektiven *Corporate Activites* und *Sustainability Maturity Models* vorgeschlagen. Inhalt weiterer Forschungsarbeiten kann somit die Anwendung weiterer Operationalisierungsansätze und deren Evaluation sein. Aktuell wird die praktische Evaluation des Ansatzes über die Anwendung bei einem mittelständischen deutschen Unternehmen vorgenommen und auf theoretischer Ebene wird das Modellverhalten zudem anhand einer Sensitivitätsanalyse analysiert. Gegenstand weiterer Forschung könnten weitere Anwendungen in verschiedenen Branchen und deren strukturierter Vergleich sein.

- Zur Operationalisierung der Perspektive *Dimensions of Sustainability* wurde im Beitrag 1 auf das Konzept der „Drei Säulen der Nachhaltigkeit“, der sogenannten Triple Bottom Line zurückgegriffen. Mit diesem Ansatz geht die Annahme einher, dass alle drei Dimensionen der Nachhaltigkeit komplementär sind und parallel umgesetzt werden („strong sustainability“ (Figge et al. 2001)). Es gibt allerdings auch Forschungsarbeiten, die auf der Annahme der gegenseitigen Substituierbarkeit der Dimensionen basieren (vgl. Cieges et al. 2009). Obwohl sich bereits erste Ansätze mit den verschiedenen Ausprägungen des Nachhaltigkeitsbegriffs beschäftigen (vgl. Kastenholz 1996; Koplin 2006; Ruhwinkel 2013), sollte in weiteren Forschungsarbeiten das Zusammenwirken der verschiedenen Dimensionen genauer analysiert werden und Handlungsempfehlungen bei komplementären oder substituierenden Verhalten der Dimensionen in verschiedenen Kontexten vorgeschlagen werden.

Aufbauend auf den in Beitrag 2 generierten Erkenntnissen schließen sich ebenfalls einige Forschungsfragen an:

- In der aktuellen Literatur sind konkrete Umsetzungs- bzw. Gestaltungshinweise einer inhaltlichen Ausgestaltung eines nachhaltigkeitsorientierten CRM bisher nicht zu finden. Es bleibt damit unklar, wie Nachhaltigkeit in den einzelnen CRM-Prozessen und in den verschiedenen Aufgabenfeldern entlang dem Kundenlebenszyklus vom Interessentenmanagement bis zum Rückgewinnungsmanagement berücksichtigt und erzielt werden kann. Weitere Forschungsarbeiten sollten sich mit der Ausgestaltung eines nachhaltigkeitsorientierten CRM in der Praxis beschäftigen und Handlungsschwerpunkte und Verbesserungsmaßnahmen vorstellen, da es bisher nur wenige Ansätze (wie bspw. die Untersuchung zu „Nachhaltigkeit und CRM“ von Ruhwinkel (2013)) dazu gibt.
- Zur Berücksichtigung von nachhaltigkeitsorientierten Aspekten in kundenorientierten Bewertungsgrößen kommt die Untersuchung in Beitrag 2 zum Schluss, dass bereits erste Ansätze wie bspw. die Customer Equity Sustainability Ratio (Skiera et al. 2011) existieren, welche die langfristigen Auswirkungen von CRM-Maßnahmen berücksichtigen. In zukünftigen Forschungsarbeiten können wertorientierte Kundenbewertungsverfahren wie der Customer Lifetime Value oder der Customer Equity (Berger und Nasr 1998) auch um soziale und ökologische Aspekte erweitert werden, um nachhaltigkeits- und kundenorientierte Maßnahmen umfassend und konsistent bewerten zu können. Dies ist von Bedeutung, da aktuell oftmals unklar

bleibt, mit welchen ökonomischen Auswirkungen die Umsetzung von Nachhaltigkeitsmaßnahmen für Unternehmen verbunden ist, da – wie bei zahlreichen anderen Projekten im Kundenbeziehungsmanagement – selten ein Monitoring oder eine Erfolgskontrolle der Maßnahmen erfolgt.

Kapitel III beleuchtet verschiedene Aspekte der Kundenintegration in Geschäftsprozesse. Auch ausgehend von den Beiträgen dieses Kapitels können einige Ansatzpunkte für weiteren Forschungsbedarf identifiziert werden.

- Obwohl Entscheidungen in der Praxis oft auf der Annahme sicherer Zahlungsströme basieren – was auch im Entscheidungsmodell des Beitrag 4 angenommen wird –, trifft dies nur auf wenige Fälle zu. Daher sollte in weiterführenden Forschungsarbeiten eine Erweiterung um eine Risikobetrachtung vorgenommen werden. Aktuell wird angenommen, dass der Entscheider risikoneutral ist. Für den Fall, dass kein risikoneutraler Entscheider unterstellt werden kann, muss das Modell folglich in ein stochastisches Optimierungsmodell übertragen werden, um die aufgrund der Risikoaversion zu berücksichtigende Unsicherheit bei der Entscheidung einfließen lassen zu können. Auch die in diesem Beitrag ausgeblendeten Wechselwirkungen zwischen Geschäftsprozessen sollten Gegenstand zukünftiger Forschungsarbeiten sein.
- Die exakte Zurechenbarkeit der Zahlungen zum jeweiligen Teilprozess bzw. zum Gesamtprozess ist in der Praxis nicht immer überschneidungsfrei möglich. Aufgrund der schweren Quantifizierbarkeit wird zudem in der Praxis keine oder nur eine unzureichende Berechnung des Customer Equity vorgenommen, so dass eine Beobachtung der Veränderungen aufgrund der Kundenintegration schwer möglich ist. Zudem können sich weitere Forschungsarbeiten mit der Ausweitung des Anwendungskontexts über die Versicherungsbranche hinaus beschäftigen, um die generelle Anwendbarkeit zu evaluieren.

Abschließend geht Kapitel IV auf wertorientierte Automatisierungsentscheidungen ein. Auch in diesem Zusammenhang bestehen Ansatzpunkte für zukünftige Forschung:

- Das Entscheidungsmodell in Beitrag 5 unterstützt die Abwägung zwischen manueller und automatischer Bearbeitung von Prozessaktionen. Dabei werden in der Arbeit ausschließlich Backend-Prozesse betrachtet, die lediglich Auszahlungen verursachen. Um Automatisierungsentscheidungen für alle Prozesse zu unterstützen, ist zusätzlich die Betrachtung der Einzahlungsseite nötig. Dies sollte daher Gegenstand weiterer

Forschung sein. Darüber hinaus ist es im Ansatz aus Kapitel V nicht möglich, Investitionsauszahlungen bspw. für Anschaffung von Systemen in die Betrachtung zu integrieren. Weiterführende Forschungsarbeiten könnten außerdem die Einschränkung aufweichen, dass jede Ressource fest einer Prozessaktion zugeordnet ist. Denn eine simultane Betrachtung mehrerer Prozesse im Unternehmen inklusive der Abhängigkeiten zwischen verschiedenen Prozessen und Standorten und damit mögliche unternehmensweite Umschichtungen von Ressourcen birgt voraussichtlich weiteres Optimierungspotenzial.

- Im Zusammenhang mit den langfristigen Effekten auf den Kundenwert wird darüber hinaus in Beitrag 4 und in Beitrag 5 davon ausgegangen, dass die monetäre Änderung des mittels des Customer Lifetime Value (CLV) bzw. Customer Equity (CE) quantifizierten Kundenwerts genau bestimmt werden kann. Dabei stellt insbesondere die implizite Annahme, dass im Kundenwert alle relevanten Wertbestandteile eines Kunden für das Unternehmen monetär berücksichtigt sind, eine Herausforderung dar. In den Standardmodellen zur Bestimmung des CLV (z.B. Berger und Nasr 1998; Blattberg et al. 2001; Dwyer 1997) werden allerdings häufig nur direkt durch den Kunden induzierte Zahlungsströme berücksichtigt, weshalb andere mögliche Wertbestandteile wie Referenz- oder Informationswert ggf. unberücksichtigt bleiben (Braun und Cornelsen 2006; Cornelsen 2006). Insbesondere vor dem Hintergrund der zunehmenden gegenseitigen Beeinflussung von Kunden untereinander besteht somit der Bedarf, traditionelle Ansätze zur Kundenbewertung wie den CLV oder den CE um derartige Komponenten zu erweitern.

Insgesamt beleuchten die Beiträge dieser Dissertationsschrift jeweils nur einzelne Aspekte des sehr umfangreichen Themas „Nachhaltigkeit und Prozessgestaltung im Customer Relationship Management“. Die Veränderungen, welche z. B. die Entwicklungen in Gesellschaft und Umwelt in den letzten Jahren mit sich gebracht haben, machen deutlich, dass das Kundenverhalten sowie die Erwartungen von Kunden an Unternehmen betreffend deren nachhaltiger Ausrichtung einem steten Wandel unterworfen sind. Dementsprechend kommt der laufenden Evaluation gesellschaftlicher und technologischer Entwicklungen für die weitere Forschung im Bereich der Kundenorientierung eine hohe Bedeutung zu, da so neue Erkenntnisse zu vergleichbaren auftretenden Phänomenen gewonnen werden können. Unternehmen können diese wissenschaftlichen Erkenntnisse dazu verwenden, ihre

kundenorientierten Strategien derart anzupassen, dass diesen geänderten Rahmenbedingungen Rechnung getragen wird.

V.3 Literatur

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